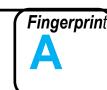
Kurdistan Region Government- Irag In the Name of Allah Ministry of Education-High Committee of General Examinations General exams for preparatory stage (Scientific)

For the academic year (2024-2025) Second Sitting

Subject: BIOLOGY Time: 3.30 hours 12th Grade



Note: choose the correct answer: - (2 marks for each right answer)

- **1-**The tissue that forms the outer layer of blood vessels differs from the tissue that forms the inner layer of blood vessels in that the tissue that forms the outer layer of blood vessels -
- A- its cells are characterized by cells that are embedded in large amounts of an intercellular substance
- **B-** is a connective tissue
- **C-** is an epithelial tissue
- **D-** both (A and B) are correct

- **2-**The smooth muscle:
- **A-** is found in the female reproductive tract.

- **B-** is arranged in opposing pairs.
- **C-** its muscle fibers are not surrounded by connective tissue. **D-** has both origin and insertion points
- **3-**Which of the following is **incorrect** regarding the cylinders in the structure of a long bone?
- A- contains vellow bone marrow.
- **B-** consists of lamellae.
- **C-** it is a part of the compact bone.
- **D-** In the center of each cylinder there is a Haversian canal
- **4-**All of the following is correct regarding the pivot joint, **EXCEPT**: -
- **A-** it is a type of a movable joint.
- **B-** it allows the body to bend and twist.
- **C-** it is found in the vertebral column.
- **D-** it is found in the axial skeleton

- **5-**Skeletal muscles:
- **A-** are not attached to the periosteum.
- **B-** are directly attached to the periosteum.
- **C-** are attached to the periosteum by a tendon.
- **D-** both (B and C) are correct
- **6-**All of the following are bones of the appendicular skeleton, **EXCEPT**: -
- A- clavicle
- **B-** sternum
- C- fibula
- **D-** scapula
- **7-**Which of the following blood vessels contains (transports) dark red blood?
- A- both superior and inferior vena cava B- Pulmonary veins C- Pulmonary artery D- both (A and C) are correct
- **8-**Which of the following is correct regarding the diastole phase?
- **A-** The direction of blood movement is from the atria to the ventricles.
- **B-** It is represented by the P wave in the electrocardiograph (ECG).
- **C-** It takes longer than the atrial contraction phase. **D-** Blood flows to fill the ventricles
- **9-**All of the following secrete a fluid that reduces(decreases) friction, **EXCEPT**: -
- **A-** pleura **B-** diaphragm **C-** the tissue that lines the surfaces of the knee joint **D-** pericardium
- **10**-White blood cells are able to perform their function because:
- **A-** they are capable of secreting blood clotting enzymes. **B-** they are formed in the red bone marrow
- C- they can squeeze their way through openings in the walls of blood vessels into the intercellular fluid.
- **D-** their nucleus and organelles disappear
- 11-The adjacent table shows the results of mixing several blood samples, which result in the following table is

			Sample 2 (Recipient)	The result (the slide shape)
	Α	A ⁻	A ⁺	
	c	O-	AB+	
٠				

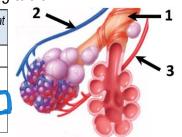
	Sample 1 (Donor)	Sample 2 (Recipient)	The result (the slide shape)		
В	AB-	O ⁺			
D	B- AB-				

- **12-**Which of the following defenses targets a specific type of pathogen?
- **A-**mucous membranes **B-**inflammatory response **C-**specific defenses
- **D**-temperature response
- **13-**Natural killer cells differ from neutrophils in that natural killer cells: -
- **A-** are white blood cells.

- **B-** contribute to general defenses.
- C- attack pathogen-infected cells with the pathogen.
- **D-** Ingest pathogens
- **14-**In which principle of Koch's postulates principles, the pathogen is grown in the laboratory?
- **A-**1 and 3.
- **B-**2 and 4
- **C-1** and 2.
- **D-**3 and 4.

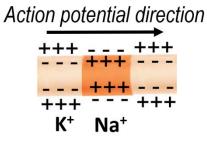
15-Based on the adjacent figure, choose the correct answer from the following table: -

		The blood in the blood vessel that is labeled by number 2: -	During exhalation the air in the structure that is labeled by number 1 passes into the: -		
A comes from the right ventricle returns to the		returns to the left atrium	alveoli		
	B returns to the left atrium		comes from the right ventricle	bronchus	
	C comes from the right ventricle		returns to the left atrium	bronchus	
	D	returns to the right ventricle	comes from the left atrium	alveoli	



- 16-Which of the following is correct regarding the secondary immune response when a person is infected with the same pathogen for the second time?
- **A-** protects the person from infecting with a new pathogen. **B-** memory cells are produced for the first time.
- **C-** memory cells immediately recognize it and begin to divide rapidly **D-** both (B and C) are correct
- 17-Antibodies bind to pathogens stopping their activity and destroying them: -
- **A-** Indirectly by the specific defenses **B-** by preventing them from entering a cell, thereby blocking its reproduction.
- **C-** by creating holes in the membranes of pathogen infected cells **D-** All of them are correct
- 18-Which of the following always presenting new antigens?
- **A-** rhinoviruses **B-** flu viruses **D-** All of them are correct
- **19-**The adjacent figure shows a part of the neuron axon, which of the following is correct regarding the movement of ions in their specific places on the figure across the neuron axon membrane?

	The movement of ions in their specific places on the figure across the neuron axon membrane					
Α	Sodium and potassium ions exit from the nerve cell					
В	Sodium and potassium ions enter the nerve cell					
С	Sodium ions exit from the nerve cell and potassium ions enter the nerve cell					
D	Sodium ions enter the nerve cell and potassium ions exit from the nerve cell					



- **20**-vesicles fuse with the presynaptic membrane when?
- **A-** neurotransmitters are broken down by enzymes.
- **B-** an action potential reaches the axon terminal of the presynaptic neuron
- **C-** neurotransmitters are reabsorbed by a postsynaptic cell. **D-** the sodium-potassium pump is activated
- **21-**The motor division of the peripheral nervous system controls: -A- skeletal muscle movement
- **B-** regulating smooth muscles **C-** secretion of all of the body's hormones directly **D-** both (A and B) are correct
- **22-**The receptors that have tiny particles of calcium carbonate on top of them, are known as:-
- **A-** mechanoreceptors. **B-** pain receptors. **C-** chemoreceptors. **D-** photoreceptors
- **23**-Which part of the cerebrum interprets touch information? **A** cerebral cortex **B-** diencephalon. **C-** midbrain. **D-** the part of the cerebrum that lies beneath the surface of the cerebral cortex
- **24-**Rods differ from cones in that, rods: **A-**are stimulated by bright light **B-** contain rhodopsin.
- **C-** initiate the production of sharp colors. **D-** respond to different colors **25-**In an addict person after removing cocaine from the synapse and dopamine release returns to normal,
- the postsynaptic neuron: -**A-** is overstimulated **B-** is under stimulated **C-** the number of receptor proteins on the postsynaptic cell decreases. **D-** both (B and C) are correct
- **26-**.....is a molecule that initiates changes inside a cell in response to the binding of a specific substance to a receptor on the outside (surface) of a cell?
- **C-** second messenger. **D-** hormone-receptor complex **A-** first messenger. **B-** receptor protein.
- **27-**In which of the following states the adrenaline is released? **A-**low blood glucose concentration **B-**when a person is stressed **C-**after the threat period has passed. **D-** both (A and B) are correct
- **28-**The secretory cells and target cells of which of the following hormones are part of the same organ? **C-** parathyroid **D-** calcitonin **A-** secretin **B-** gastrin
- **29-**All of the following groups have a hormone that the site of secretion does not belong to them, EXCEPT: -
- **A-** insulin, prostaglandin, glucagon. **B-** oxytocin, epinephrine, antidiuretic hormone **C-** aldosterone, cortisol, glucagon **D-** thyroid stimulating hormone, adrenocorticotropic hormone, follicle-stimulating hormone

3	3 <i>0</i> -1	Which of the following is correct regardir	ng the vas deference?					
		it loops around the urethra.	B- each normal male p	person has two				
	C- transports semen to the urethra. D- all of them are correct							
3	3 1 -1	Which of the following secretes testosteron	e?					
	A-	testis B- seminal vesicles C-	prostate gland D- All of them	n are incorrect				
3	32 -/	All of the following occur in the fallopian tub	e, <u>EXCEPT</u> : -					
	A-	formation of morula B- formation of zy	gote C- meiosis II of the egg	D- formation of first polar body				
3		Which of the following secretes estroger						
	A-	the mature egg B- corpus luteum	C- growing umbilical cord	D- All of them are correct				
	A- B- C-	According on the adjacent figure that shows of the fetal portion of placenta, choose the continumbers 1 and 2 point to maternal veins, numbers 1 and 2 point to maternal arteries number 1 points to an umbilical vein, and number 1 points to a maternal vein and the	orrect answer from the following:- , number 2 points a maternal vein					
ءا		During the first trimester:	Hamber 2 points to an ambinear art	City				
ľ		primary germ layers do not form. B- the	four embryonic membranes are not	formed				
		the mother does not feel the movement of		does not start beating				
3		n which of the following crosses, the ge		J				
	A-	monohybrid cross (heterozygous × hete incomplete dominance (heterozygous ×	rozygous) B- monohybrid cross	(heterozygous × heterozygous)				
3		n Mendelian genetics, an allele (factor) is c						
	A- able to express itself only in the homozygous state B- able to express itself only in the heterozygous state							
		able to mask the effect of the other allele (f						
١		blending of two alleles occurs in the hetero	, .					
	A-	According to Mendel's experiments on p Tt × Tt	× TT D- All of them are o	correct				
3		Which of the following is a sequence of I		of a DNA molecule that is				
	transcribed into a codon but then its not translated?							
l,		TAC B-ACT C-ATC	D- both (B and C) are o					
4		The two adjacent figures represent the resu	-	iments,				
	in v	vhich experiment they used ³⁵ S and in whi	ch experiment they used ³² P?	4				
	A-	In the first experiment they used $^{f 35}$ S, in the	e second experiment they used ³² P	1 2 1 2 2 E				
	B-	in the first experiment they used $^{f 32}$ P, in the	e second experiment they used ³⁵ S					
	C-	in both experiments they used ³⁵ S						
	D- in both experiments they used ³² P Experiment 1 Experiment 2							
4		According to the adjacent figure that shows t	,					
1		npleting this process, which of the choices in	ū					
1	reg	arding the ratio of pyrimidines and the ratio o	of purines?					
		The ratio of pyrimidines in theis equal to the ratio of		AL to the				
1	Α	purines in the Strand 2 , strand 4	ratio of purines in the Strand 1 , strand 3	2				
1	В	Strand 1 , strand 4	Strand 2 , strand 4	1				
1	С	Strand 2 , strand 3	Strand 3 , strand 4	EX (2) 4				
1	D	Strand 1 , strand 3	Strand 2 strand 3	`3				

42-Which of the following is incorrect regarding the process of protein synthesis in eukaryotes?

A-by using the codon table, the codon GCU specifies the amino acid alanine in the genetic code of all living organisms

B- In the transcription, a part of one of the two DNA strands is used to transcribe tRNA

C- The translation can begin even before transcription has finished **D-** transcription takes place in the nucleus.

43-At which step of translation does the last tRNA leave the ribosome?

A- elongation **B-** initiation

C- termination

D- disassembly

44-In a monohybrid cross, if half of the resulting offspring show the dominant trait, the genotype of the parents: -

A- both are heterozygous. **B-** one is heterozygous and the other is homozygous dominant

C- one is heterozygous and the other is recessive. **D-** both are homozygous

45-In a dihybrid cross between two pea plants, one has short stem and axial flowers and the other is unknown for both traits, these ratios produced (1 short stem plant and axial flowers: 1 short stem plant and terminal flowers), which of the following represents the phenotype of the unknown plant:-

A- short stem and terminal flowers

B- tall stem and terminal flowers

C- short stem and axial flowers

D-tall stem and axial flowers

46-Which of the following is correct regarding the structure of a DNA molecule?

1.the number of sugar molecules is equal to the number of the phosphate group molecules.

2. each nucleotide can differ from another nucleotide only in the type of nitrogenous base.

3.the nitrogenous base is connected to the phosphate group directly by a covalent bond.

A-1, 2.

B- 1, 3

C- 2, 3

D- 1, 2, 3

47-The promoter differs from the start codon in that the promoter: -

A- is a specific nucleotide sequence of DNA.

C- indicates where translation should begin

48-According to the adjacent codon table, if this DNA sequence (CTCAAGTGCTTC) complements the strand that serves as a template to make mRNA, which of the following polypeptides

is produced? **A-** Leucine – Tyrosine –Arginine – Phenylalanine

B- Valine – Aspartic Acid – Proline – Histidine

C- Leucine – Lysine – Cysteine – Phenylalanine

D- Proline – Glutamic Acid – Leucine – valine

B- DNA polymerase binds to it

D- both (A and B) are correct

Codons in mRNA						
First bas	e	Secon	d base		Third base	
	U	С	Α	G		
U	Phenylalanine Phenylalanine Leucine Leucine	Serine Serine Serine Serine	Tyrosine Tyrosine Stop Stop	Cysteine Cysteine Stop Tryptophan	UCAG	
С	Leucine Leucine Leucine Leucine	Proline Proline Proline Proline	Histidine Histidine Glutamine Glutamine	Arginine Arginine Arginine Arginine	UCAG	
Α	Isoleucine Isoleucine Isoleucine Methionine (start)	Threonine Threonine Threonine Threonine	Asparagine Asparagine Lysine Lysine	Serine Serine Arginine Arginine	UCAG	
G	Valine Valine Valine Valine	Alanine Alanine Alanine Alanine	Aspartic acid Aspartic acid Glutamic acid Glutamic acid	Glycine Glycine Glycine Glycine	U C A G	

49-Test cross determines the genotype of any individual who expresses the: -

A- dominant phenotype.

C- dominant phenotype and recessive phenotype

B- recessive phenotype

D- intermediate phenotype

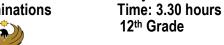
50-In the 28-day period of the ovarian and menstrual cycles, which of the following occurs one after the other (in sequence)? (1- Secretion of follicle-stimulating hormone, 2- Formation of corpus luteum, 3- Growth and development of the follicle, 4- Ovulation, 5- The sharp rise in the concentration of luteinizing hormone)

A-2 1 3 5 4 **C-**3 1 2 5 4

B-1 3 5 4 2 **D-1** 3 2 5 4

Kurdistan Region Government- Irag

In the Name of Allah Ministry of Education-High Committee of General Examinations General exams for preparatory stage (Scientific) For the academic year (2024-2025) Second Sitting



Subject: BIOLOGY



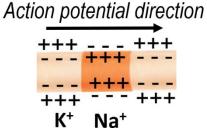
Note: choose the correct answer: - (2 marks for each right answer)

1-In which of the following crosses, the genotype ratio of homozygous and heterozygous is equal to 1:1: -

A- monohybrid cross (heterozygous × heterozygous) **B-** monohybrid cross (heterozygous × heterozygous) **C-** incomplete dominance (heterozygous × heterozygous) **D-** All of them are correct

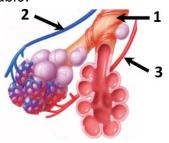
2-The adjacent figure shows a part of the neuron axon, which of the following is correct regarding the movement of ions in their specific places on the figure across the neuron axon membrane?

	The movement of ions in their specific places on the figure across the neuron axon membrane					
Α	Sodium and potassium ions exit from the nerve cell					
В	Sodium and potassium ions enter the nerve cell					
С	Sodium ions exit from the nerve cell and potassium ions enter the nerve cell					
D	Sodium ions enter the nerve cell and potassium ions exit from the nerve cell					



3-Based on the adjacent figure, choose the correct answer from the following table: -

	The blood in the blood vessel that is labeled by number 2: -	The blood in the blood vessel that is labeled by number 3: -	During exhalation the air in the structure that is labeled by number 1 passes into the: -
Α	comes from the right ventricle	returns to the left atrium	alveoli
В	returns to the left atrium	comes from the right ventricle	bronchus
C	comes from the right ventricle	returns to the left atrium	bronchus
D	returns to the right ventricle	comes from the left atrium	alveoli



4-Which of the following defenses targets a specific type of pathogen?

A-mucous membranes **B-**inflammatory response **C-**specific defenses

D-temperature response

5-Which of the following always presenting new antigens?

A- rhinoviruses

B- flu viruses

D- All of them are correct

6-The receptors that have tiny particles of calcium carbonate on top of them, are known as:-

A- mechanoreceptors. **B-** pain receptors. **C-** chemoreceptors. **D-** photoreceptors

7-Which of the following is a sequence of nucleotides in the template strand of a DNA molecule that is transcribed into a codon but then its not translated?

A-TAC

B- ACT

C- ATC

D- both (B and C) are correct

8-All of the following is correct regarding the pivot joint, **EXCEPT**: -

A- it is a type of a movable joint.

B- it allows the body to bend and twist.

C- it is found in the vertebral column.

D- it is found in the axial skeleton

9-In which of the following states the adrenaline is released? **A-**low blood glucose concentration **B-**when a person is stressed **C-**after the threat period has passed. **D-** both (A and B) are correct

10-Which of the following blood vessels contains (transports) dark red blood?

A- both superior and inferior vena cava B- Pulmonary veins C- Pulmonary artery D- both (A and C) are correct

11-Natural killer cells differ from neutrophils in that natural killer cells: -**A-** are white blood cells.

B- contribute to general defenses.

C- attack pathogen-infected cells with the pathogen.

D- Ingest pathogens

12-Which of the following is correct regarding the vas deference?

B- each normal male person has two **A-** it loops around the urethra.

C- transports semen to the urethra.

D- all of them are correct

13-The motor division of the peripheral nervous system controls: -**A-** skeletal muscle movement **B-** regulating smooth muscles **C-** secretion of all of the body's hormones directly **D-** both (A and B) are correct

14-All of the following groups have a hormone that the site of secretion does not belong to them, **EXCEPT**: -

A- insulin, prostaglandin, glucagon. **B-** oxytocin, epinephrine, antidiuretic hormone **C-** aldosterone, cortisol, glucagon

D- thyroid stimulating hormone, adrenocorticotropic hormone, follicle-stimulating hormone

15-The smooth muscle:

A- is found in the female reproductive tract.

B- is arranged in opposing pairs.

C- its muscle fibers are not surrounded by connective tissue. **D-** has both origin and insertion points

16-Which of the following is correct regarding the diastole phase?

A- The direction of blood movement is from the atria to the ventricles.

B- It is represented by the P wave in the electrocardiograph (ECG).

C- It takes longer than the atrial contraction phase. D- Blood flows to fill the ventricles

17-The tissue that forms the outer layer of blood vessels differs from the tissue that forms the inner layer of blood vessels in that the tissue that forms the outer layer of blood vessels -

A- its cells are characterized by cells that are embedded in large amounts of an intercellular substance

B- is a connective tissue

C- is an epithelial tissue

D- both (A and B) are correct

18-During the first trimester:

A- primary germ layers do not form. **B-** the four embryonic membranes are not formed

C- the mother does not feel the movement of the fetus.

D- the heart does not start beating

19-Skeletal muscles:

A- are not attached to the periosteum.

B- are directly attached to the periosteum.

C- are attached to the periosteum by a tendon.

D- both (B and C) are correct

20-Which of the following is **incorrect** regarding the cylinders in the structure of a long bone?

A- contains yellow bone marrow.

B- consists of lamellae.

C- it is a part of the compact bone.

D- In the center of each cylinder there is a Haversian canal

21-Antibodies bind to pathogens stopping their activity and destroying them: -

A- Indirectly by the specific defenses **B-** by preventing them from entering a cell, thereby blocking its reproduction.

C- by creating holes in the membranes of pathogen infected cells **D-** All of them are correct

22-vesicles fuse with the presynaptic membrane when?

A- neurotransmitters are broken down by enzymes.

B- an action potential reaches the axon terminal of the presynaptic neuron

C- neurotran'smitters are reabsorbed by a postsynaptic cell. **D-** the sodium-potassium pump is activated

23-Which part of the cerebrum interprets touch information? **A-** cerebral cortex **B-** diencephalon. **C-** midbrain. **D-** the part of the cerebrum that lies beneath the surface of the cerebral cortex

24-According on the adjacent figure that shows the endometrium, maternal portion of placenta,

and the fetal portion of placenta, choose the correct answer from the following:-**A-** numbers 1 and 2 point to maternal veins,

B- numbers 1 and 2 point to maternal arteries,

C- number 1 points to an umbilical vein, and number 2 points a maternal vein

D- number 1 points to a maternal vein and the number 2 points to an umbilical artery

25-In which principle of Koch's postulates principles, the pathogen is grown in the laboratory?

A-1 and 3. **B-**2 and 4 **C-1** and 2. **D-**3 and 4.

26-In an addict person after removing cocaine from the synapse and dopamine release returns to normal. the postsynaptic neuron: -**A-** is overstimulated **B-** is under stimulated **C-** the number of receptor proteins on the postsynaptic cell decreases. **D-** both (B and C) are correct

27-All of the following secrete a fluid that reduces (decreases) friction. **EXCEPT**: -

A- pleura **B-** diaphragm **C-** the tissue that lines the surfaces of the knee joint **D-** pericardium

28-Rods differ from cones in that, rods: - **A-**are stimulated by bright light **B-** contain rhodopsin. **C-** initiate the production of sharp colors. **D-** respond to different colors

29-Which of the following secretes estrogen?

A- the mature egg **B-** corpus luteum **C-** growing umbilical cord

D- All of them are correct

30-All of the following occur in the fallopian tube, **EXCEPT**: -

A- formation of morula **B-** formation of zygote **C-** meiosis II of the egg **D-** formation of first polar body

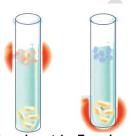
31-According to Mendel's experiments on pea plants, which of the following represents cross-pollination?

 $C-TT \times TT$ $A-Tt \times Tt$ **B-** TT × # **D-** All of them are correct

32-.....is a molecule that initiates changes inside a cell in response to the binding of a specific substance to a receptor on the outside (surface) of a cell?

A- first messenger. **B-** receptor protein. **C-** second messenger. **D-** hormone-receptor complex 0002

A- they are C- they can D- their nuc A- able to ex C- able to m D- blending of A- testis A- testis A- secretin A- which of with the san A- protects C- memory	cap squaleus ian corresponding the i the cell	pable of some pable of some parties, and orgonetics, and orgonetics, and the effect wo alleles following some person files immedials immedials.	ecreting blacer way throw an elles distanced an allele (family in the hose cours in the secretes testal vesicles and target central for the secretein is correct for the secretein infection infecti	nctor) is considered omozygous state or allele (factor) in the heterozygous state stosterone? C- prostate tells of which of to cregarding the se	eymes. In the ware In the ware In the het In the het In the follow In the follow In the divinition of the divinition of the divinition of the symmetry In to divinity the symmetry In the t	alls don de to ero win hyr ry i	B- they and of blood of blood of blood of blood of the bl	itself only intention of them are nes are paresponse were necessity of the mare nes are paresponse were necessity cells are necessity ne	n the heterozygo incorrect t of the same of calcitonin then a person is produced for the	ar fluid. us state rgan? infected ne first time. orrect
correct?		Sample 1 (Donor)	Sample 2 (Recipient)	The result (the slide shape)		2	Sample 1 (Donor)	Sample 2 (Recipient)	The result (the slide shape)	g ware to
	Α	A ⁻	A ⁺			В	AB-	O ⁺		
	С	0-	AB+			D	B⁻	AB ⁻		
39 -All of the following are bones of the appendicular skeleton, <u>EXCEPT</u> : - A- clavicle B- sternum C- fibula D- scapula										
in which exp	!O- The two adjacent figures represent the results of the Hershey and Chase experiments, in which experiment they used ³⁵ S and in which experiment they used ³² P?									
A- In the first experiment they used ³⁵ S, in the second experiment they used ³² P										





Experiment 1 Experiment 2

D- in both experiments they used ³²P **41-**In a monohybrid cross, if half of the resulting offspring show the dominant trait, the genotype of the parents: -

B- in the first experiment they used ³²P, in the second experiment they used ³⁵S

A- both are heterozygous. **B-** one is heterozygous and the other is homozygous dominant

C- one is heterozygous and the other is recessive.

D- both are homozygous

42-In a dihybrid cross between two pea plants, one has short stem and axial flowers and the other is unknown for both traits, these ratios produced (1 short stem plant and axial flowers: 1 short stem plant and terminal flowers), which of the following represents the phenotype of the unknown plant:-

A- short stem and terminal flowers

C- in both experiments they used ³⁵S

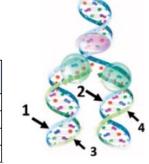
B- tall stem and terminal flowers

C- short stem and axial flowers

D-tall stem and axial flowers

43- According to the adjacent figure that shows the process of DNA replication, after completing this process, which of the choices in the following table is correct regarding the ratio of pyrimidines and the ratio of purines?

	The ratio of pyrimidines in theis equal to the ratio of purines in the	The ratio of pyrimidines in theis <u>NOT EQUAL</u> to the ratio of purines in the
Α	Strand 2 , strand 4	Strand 1 , strand 3
В	Strand 1 , strand 4	Strand 2 , strand 4
С	Strand 2 , strand 3	Strand 3 , strand 4
D	Strand 1 , strand 3	Strand 2 , strand 3



44-According to the adjacent codon table, if this DNA sequence (CTCAAGTGCTTC) complements the strand that serves as a template to make mRNA, which of the following polypeptides is produced?

B- Valine – Aspartic Acid – Proline – Histidine

C- Leucine – Lysine – Cysteine – Phenylalanine

D- Proline – Glutamic Acid – Leucine – valine

irst bas	e	Secon	d base		Third bas
	U	С	Α	G	
U	Phenylalanine Phenylalanine Leucine Leucine	Serine Serine Serine Serine	Tyrosine Tyrosine Stop Stop	Cysteine Cysteine Stop Tryptophan	UCAG
С	Leucine Leucine Leucine Leucine	Proline Proline Proline Proline	Histidine Histidine Glutamine Glutamine	Arginine Arginine Arginine Arginine	U C A G
Α	Isoleucine Isoleucine Isoleucine Methionine (start)	Threonine Threonine Threonine Threonine	Asparagine Asparagine Lysine Lysine	Serine Serine Arginine Arginine	U C A G
G	Valine Valine Valine Valine	Alanine Alanine Alanine Alanine	Aspartic acid Aspartic acid Glutamic acid Glutamic acid	Glycine Glycine Glycine Glycine	U C A G

45-Test cross determines the genotype of any individual who expresses the: -

A- dominant phenotype.

C- dominant phenotype and recessive phenotype

B- recessive phenotype **D-** intermediate phenotype

46-At which step of translation does the last tRNA leave the ribosome?

A- elongation

B- initiation

C- termination

D- disassembly

47-The promoter differs from the start codon in that the promoter: -

A- is a specific nucleotide sequence of DNA.

B- DNA polymerase binds to it

C- indicates where translation should begin

D- both (A and B) are correct

48-Which of the following is correct regarding the structure of a DNA molecule? 1.the number of sugar molecules is equal to the number of the phosphate group molecules.

2. each nucleotide can differ from another nucleotide only in the type of nitrogenous base. 3.the nitrogenous base is connected to the phosphate group directly by a covalent bond.

A-1, 2.

B- 1, 3

C- 2, 3

D- 1, 2, 3

49-In the 28-day period of the ovarian and menstrual cycles, which of the following occurs one after the other (in sequence)? (1- Secretion of follicle-stimulating hormone, 2- Formation of corpus luteum, 3- Growth and development of the follicle, 4- Ovulation, 5- The sharp rise in the concentration of luteinizing hormone)

50-Which of the following is **incorrect** regarding the process of protein synthesis in eukaryotes?

A-by using the codon table, the codon GCU specifies the amino acid alanine in the genetic code of all living organisms

B- In the transcription, a part of one of the two DNA strands is used to transcribe tRNA

C- The translation can begin even before transcription has finished **D-** transcription takes place in the nucleus.

Kurdistan Region Government- Irag

In the Name of Allah Ministry of Education-High Committee of General Examinations General exams for preparatory stage (Scientific) For the academic year (2024-2025) Second Sitting

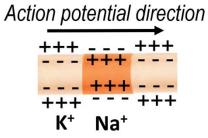
Subject: BIOLOGY Time: 3.30 hours 12th Grade



Note: choose the correct answer: - (2 marks for each right answer)

- **1-**Which of the following blood vessels contains (transports) dark red blood?
- **A-** both superior and inferior vena cava **B-** Pulmonary veins **C-** Pulmonary artery **D-** both (A and C) are correct
- **2-**Which of the following is **incorrect** regarding the cylinders in the structure of a long bone?
- **A-** contains yellow bone marrow.
- **B-** consists of lamellae.
- **C-** it is a part of the compact bone.
- **D-** In the center of each cylinder there is a Haversian canal
- **3-**The adjacent figure shows a part of the neuron axon, which of the following is correct regarding the movement of ions in their specific places on the figure across the neuron axon membrane?

The movement of ions in their specific places on the figure across the neuron axon membrane
Sodium and potassium ions exit from the nerve cell
Sodium and potassium ions enter the nerve cell
Sodium ions exit from the nerve cell and potassium ions enter the nerve cell
Sodium ions enter the nerve cell and potassium ions exit from the nerve cell



- **4-**All of the following groups have a hormone that the site of secretion <u>does not</u> belong to them, **EXCEPT**: -
- **A-** insulin, prostaglandin, glucagon. **B-** oxytocin, epinephrine, antidiuretic hormone **C-** aldosterone, cortisol, glucagon
- **D-** thyroid stimulating hormone, adrenocorticotropic hormone, follicle-stimulating hormone
- **5-**White blood cells are able to perform their function because:
- **A-** they are capable of secreting blood clotting enzymes. **B-** they are formed in the red bone marrow
- C- they can squeeze their way through openings in the walls of blood vessels into the intercellular fluid.
- **D-** their nucleus and organelles disappear
- **6-**Rods differ from cones in that, rods: **A-**are stimulated by bright light **B-** contain rhodopsin. **C-** initiate the production of sharp colors. **D-** respond to different colors
- **7-**According on the adjacent figure that shows the endometrium, maternal portion of placenta. and the fetal portion of placenta, choose the correct answer from the following:-
- **A-** numbers 1 and 2 point to maternal veins,
- **B-** numbers 1 and 2 point to maternal arteries,
- **C-** number 1 points to an umbilical vein, and number 2 points a maternal vein
- **D-** number 1 points to a maternal vein and the number 2 points to an umbilical artery
- **8-**In an addict person after removing cocaine from the synapse and dopamine release returns to normal, **A-** is overstimulated B- is under stimulated the postsynaptic neuron: -**C-** the number of receptor proteins on the postsynaptic cell decreases. **D-** both (B and C) are correct
- **9-**vesicles fuse with the presynaptic membrane when?
- **A-** neurotransmitters are broken down by enzymes.
- **B-** an action potential reaches the axon terminal of the presynaptic neuron
- **C-** neurotransmitters are reabsorbed by a postsynaptic cell. **D-** the sodium-potassium pump is activated
- **10-**Which of the following always presenting new antigens?
- **B-** flu viruses **A-** rhinoviruses
- **D-** All of them are correct
- **11-**In which of the following crosses, the genotype ratio of homozygous and heterozygous is equal to 1:1: -
- A- monohybrid cross (heterozygous × heterozygous) B- monohybrid cross (heterozygous × heterozygous) **C-** incomplete dominance (heterozygous × heterozygous) **D-** All of them are correct
- **12-**The tissue that forms the outer layer of blood vessels differs from the tissue that forms the inner layer of blood vessels in that the tissue that forms the outer layer of blood vessels -
- **A-** its cells are characterized by cells that are embedded in large amounts of an intercellular substance
- **B-** is a connective tissue
- C- is an epithelial tissue
- **D-** both (A and B) are correct

- **13-**Which of the following is a sequence of nucleotides in the template strand of a DNA molecule that is transcribed into a codon but then its not translated?
- **A-**TAC **B-** ACT C- ATC **D-** both (B and C) are correct
- 14-Which of the following is correct regarding the secondary immune response when a person is infected with the same pathogen for the second time?
- **A-** protects the person from infecting with a new pathogen. **B-** memory cells are produced for the first time. **C-** memory cells immediately recognize it and begin to divide rapidly **D-** both (B and C) are correct
- **15-**The adjacent table shows the results of mixing several blood samples, which result in the following table is correct?

	Sample 1 (Donor)	Sample 2 (Recipient)	The result (the slide shape)
Α	A -	A ⁺	
С	O-	AB+	

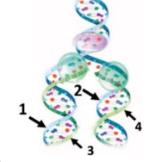
	Sample 1 (Donor)	Sample 2 (Recipient)	The result (the slide shape)
В	AB ⁻	O ⁺	
D	B-	AB ⁻	

- 16-Which of the following defenses targets a specific type of pathogen?
- A-mucous membranes B-inflammatory response **C-**specific defenses **D**-temperature response
- 17-According to Mendel's experiments on pea plants, which of the following represents cross-pollination? **B-** TT × tt C- TT × TT **D-** All of them are correct
- **18-**Which of the following is correct regarding the diastole phase?
- **A-** The direction of blood movement is from the atria to the ventricles.
- **B-** It is represented by the P wave in the electrocardiograph (ECG).
- **C-** It takes longer than the atrial contraction phase. **D-** Blood flows to fill the ventricles
- **19-**Which of the following secretes estrogen?
- **A-** the mature egg **B-** corpus luteum **C-** growing umbilical cord **D-** All of them are correct
- **20-**.....is a molecule that initiates changes inside a cell in response to the binding of a specific substance to a receptor on the outside (surface) of a cell?
- **A-** first messenger. **B-** receptor protein. **C-** second messenger. **D-** hormone-receptor complex
- **21-**The motor division of the peripheral nervous system controls: **A-** skeletal muscle movement
- **B-** regulating smooth muscles **C-** secretion of all of the body's hormones directly **D-** both (A and B) are correct
- **22-**All of the following are bones of the appendicular skeleton, **EXCEPT**: -
- **A-** clavicle **B-** sternum **C-** fibula
- **23**-In which principle of Koch's postulates principles, the pathogen is grown in the laboratory?
- **A-**1 and 3. **B-**2 and 4 **C-**1 and 2. **D-**3 and 4.
- **24-**The smooth muscle:
- **A-** is found in the female reproductive tract.
- **B-** is arranged in opposing pairs.
- **C-** its muscle fibers are not surrounded by connective tissue. **D-** has both origin and insertion points
- **25**-During the first trimester:
- **A-** primary germ layers do not form. **B-** the four embryonic membranes are not formed
- **C-** the mother does not feel the movement of the fetus. **D-** the heart does not start beating
- **26**-Which part of the cerebrum interprets touch information? **A-** cerebral cortex **B-** diencephalon. **C-** midbrain. **D-** the part of the cerebrum that lies beneath the surface of the cerebral cortex
- 27-All of the following secrete a fluid that reduces (decreases) friction, EXCEPT: -
- **A-** pleura **B-** diaphragm **C-** the tissue that lines the surfaces of the knee joint **D-** pericardium
- **28-**All of the following is correct regarding the pivot joint, **EXCEPT**: -
- **B-** it allows the body to bend and twist. **A-** it is a type of a movable joint.
- **D-** it is found in the axial skeleton **C-** it is found in the vertebral column.
- **29-**The receptors that have tiny particles of calcium carbonate on top of them, are known as:-**A-** mechanoreceptors. **B-** pain receptors. **C-** chemoreceptors. **D-** photoreceptors

30 -Which of the following is			naraan haa tura	44 -At wh
A- it loops around the uret C- transports semen to the		B- each normal male properties D- all of them are corr		A- elon
31- Natural killer cells differ			661	45- Acco
A- are white blood cells.	Trom Trodu oprimo in the		ribute to general defenses.	completi
C- attack pathogen-infecte	ed cells with the pathog		est pathogens	regardin
32- The secretory cells and				The re
	- gastrin	C- parathyroid	D- calcitonin	Α
33- Skeletal muscles: A- are not attached to the	norioetoum	B- are directly attache	nd to the periostoum	B
		D- both (B and C) are		D
34- All of the following occur is	•	. ,		46- Acco
			D- formation of first polar body	sequen
35 -Antibodies bind to pathog				strand t
			II, thereby blocking its reproduction.	mRNA,
C- by creating holes in the n			hem are correct	is produ
36- Based on the adjacent t	<u> </u>		2 // 1	A- Leuc
The blood in the blood vessel that is labeled by number 2: -	The blood in the blood vessel that is labeled by number 3: -	During exhalation the air in the structure the is labeled by number 1 passes into the: -		B- Valir
A comes from the right ventricle	returns to the left atrium	alveoli		C- Leuc
B returns to the left atrium	comes from the right ventricle	bronchus	3	D- Proli
C comes from the right ventricle	returns to the left atrium	bronchus		47- Test
D returns to the right ventricle	comes from the left atrium	alveoli		A- dom
37- In Mendelian genetics, an	allele (factor) is conside	ered as a dominant if:		C- dom
			only in the heterozygous state	48- The p
C- able to mask the effect of				A- is a
D- blending of two alleles of	, ,			C- indic
_	ed C- after the thr	is released? A-low bid eat period has passed.	Dod glucose concentration D- both (A and B) are correct	49- In a d
39 -Which of the following sec		- (which of
A- testis B- seminal	•	•	m are incorrect	A- short
40 -The two adjacent figures	·		riments,	C- short
in which experiment they us	•	•	103	50- In the
A- In the first experiment the	ey used ³⁵ S, in the seco	nd experiment they used ³² P		(in sequ
B- in the first experiment the	ey used $^{f 32}$ P, in the seco	nd experiment they used $^{f 35}$ S		develop
C- in both experiments they	used ³⁵ S			A- 2
D- in both experiments they	used 32P		Experiment 1 Experiment 2	C- 3
41 -Which of the following is <u>in</u>		ocess of protein synthesis in e	ukarvotes?	
_			genetic code of all living organisms	
	•	rands is used to transcribe tRN		
		has finished D- transcripti		
42-Which of the following is	s correct regarding the	structure of a DNA molecu	le?	
		number of the phosphate g		
		otide only in the type of nitro	•	
3.the nitrogenous base is	connected to the phos	phate group directly by a co	ovalent bond.	
A- 1, 2. B-	1, 3 C	- 2, 3 D- 1, 2,	3	
-	_	. •	ait, the genotype of the parents: -	
, ,	, , ,	ous and the other is homoz		
C- one is heterozygous an	nd the other is recessiv	re. D- both are homoz	vgous	

- nich step of translation does the last tRNA leave the ribosome?
 - gation
- **B-** initiation
- **C-** termination
- **D-** disassembly
- rding to the adjacent figure that shows the process of DNA replication, after ng this process, which of the choices in the following table is correct g the ratio of pyrimidines and the ratio of purines?

	The ratio of pyrimidines in theis equal to the ratio of purines in the	The ratio of pyrimidines in theis <u>NOT EQUAL</u> to the ratio of purines in the
Α	Strand 2 , strand 4	Strand 1 , strand 3
В	Strand 1 , strand 4	Strand 2 , strand 4
С	Strand 2 , strand 3	Strand 3 , strand 4
D	Strand 1 . strand 3	Strand 2 . strand 3



rding to the adjacent codon table, if this DNA Codons in mRNA ce (CTCAAGTGCTTC) complements the hat serves as a template to make which of the following polypeptides iced?

- cine Tyrosine –Arginine Phenylalanine
- ne Aspartic Acid Proline Histidine
- cine Lysine Cysteine Phenylalanine
- ine Glutamic Acid Leucine valine

First bas	e e	Secon	d base		Third base
	U	С	Α	G	
U	Phenylalanine Phenylalanine Leucine Leucine	Serine Serine Serine Serine	Tyrosine Tyrosine Stop Stop	Cysteine Cysteine Stop Tryptophan	U C A G
С	Leucine Leucine Leucine Leucine	Proline Proline Proline Proline	Histidine Histidine Glutamine Glutamine	Arginine Arginine Arginine Arginine	U C A G
Α	Isoleucine Isoleucine Isoleucine Methionine (start	Threonine Threonine Threonine Threonine	Asparagine Asparagine Lysine Lysine	Serine Serine Arginine Arginine	U C A G
G	Valine Valine Valine Valine	Alanine Alanine Alanine Alanine	Aspartic acid Aspartic acid Glutamic acid Glutamic acid	Glycine Glycine Glycine Glycine	U C A G

cross determines the genotype of any individual who expresses the: -

- inant phenotype.
- inant phenotype and recessive phenotype
- **D-** intermediate phenotype

B- recessive phenotype

- promoter differs from the start codon in that the promoter: -
- specific nucleotide sequence of DNA.
- **B-** DNA polymerase binds to it
- ates where translation should begin
- **D-** both (A and B) are correct
- lihybrid cross between two pea plants, one has short stem and axial flowers and the other is unknown for ts, these ratios produced (1 short stem plant and axial flowers: 1 short stem plant and terminal flowers), the following represents the phenotype of the unknown plant:-
- stem and terminal flowers
- **B-** tall stem and terminal flowers

stem and axial flowers

- **D-**tall stem and axial flowers
- 28-day period of the ovarian and menstrual cycles, which of the following occurs one after the other uence)? (1- Secretion of follicle-stimulating hormone, 2- Formation of corpus luteum, 3- Growth and ment of the follicle, 4- Ovulation, 5- The sharp rise in the concentration of luteinizing hormone)



1 2 5 4

Kurdistan Region Government- Iraq In the Name of Allah Ministry of Education-High Committee of General Examinations General exams for preparatory stage (Scientific) For the academic year (2024-2025) Second Sitting

Subject: BIOLOGY Time: 3.30 hours 12th Grade



Note: choose the correct answer: - (2 marks for each right answer)

1- Which of the following secretes testosters	ne?
--	-----

A- testis **B-** seminal vesicles

C- prostate gland

- **D-** All of them are incorrect
- **2-**Which part of the cerebrum interprets touch information? **A-** cerebral cortex **B-** diencephalon. **C-** midbrain. **D-** the part of the cerebrum that lies beneath the surface of the cerebral cortex
- **3-**The smooth muscle:
- **A-** is found in the female reproductive tract.

B- is arranged in opposing pairs.

- **C-** its muscle fibers are not surrounded by connective tissue. **D-** has both origin and insertion points
- **4-**All of the following occur in the fallopian tube, **EXCEPT**: -
- **A-** formation of morula **B-** formation of zygote **C-** meiosis II of the egg **D-** formation of first polar body
- 5-Which of the following is correct regarding the secondary immune response when a person is infected with the same pathogen for the second time?
- **A-** protects the person from infecting with a new pathogen. **B-** memory cells are produced for the first time.
- **C-** memory cells immediately recognize it and begin to divide rapidly **D-** both (B and C) are correct
- 6-Skeletal muscles:
- **A-** are not attached to the periosteum.

B- are directly attached to the periosteum.

- **C-** are attached to the periosteum by a tendon.
- **D-** both (B and C) are correct
- **7-**In which of the following crosses, the genotype ratio of homozygous and heterozygous is equal to 1:1: -
- **A-** monohybrid cross (heterozygous × heterozygous) **B-** monohybrid cross (heterozygous × heterozygous)
- **C-** incomplete dominance (heterozygous × heterozygous) **D-** All of them are correct
- **8-**According on the adjacent figure that shows the endometrium, maternal portion of placenta, and the fetal portion of placenta, choose the correct answer from the following:-
- **A-** numbers 1 and 2 point to maternal veins,
- **B-** numbers 1 and 2 point to maternal arteries,
- **C-** number 1 points to an umbilical vein, and number 2 points a maternal vein
- **D-** number 1 points to a maternal vein and the number 2 points to an umbilical artery
- **9-**The secretory cells and target cells of which of the following hormones are part of the same organ?
- A- secretin
- **B-** gastrin
- **C-** parathyroid
- **D-** calcitonin
- **10-**Natural killer cells differ from neutrophils in that natural killer cells: -
- **A-** are white blood cells.

B- contribute to general defenses.

- **C-** attack pathogen-infected cells with the pathogen.
- **D-** Ingest pathogens
- **11-**In an addict person after removing cocaine from the synapse and dopamine release returns to normal. the postsynaptic neuron: -**A-** is overstimulated **B-** is under stimulated
- **C-** the number of receptor proteins on the postsynaptic cell decreases. **D-** both (B and C) are correct
- **12**-Which of the following blood vessels contains (transports) dark red blood?
- **A-** both superior and inferior vena cava **B-** Pulmonary veins **C-** Pulmonary artery **D-** both (A and C) are correct
- **13**-Rods differ from cones in that, rods: **A**-are stimulated by bright light **B** contain rhodopsin.
 - **C-** initiate the production of sharp colors. **D-** respond to different colors
- **14-**In which principle of Koch's postulates principles, the pathogen is grown in the laboratory?
- **A-1** and 3.
- **B-**2 and 4
- **C-1** and 2.
- **D-**3 and 4.
- **15-**All of the following groups have a hormone that the site of secretion does not belong to them, EXCEPT: -
- **A-** insulin, prostaglandin, glucagon. **B-** oxytocin, epinephrine, antidiuretic hormone **C-** aldosterone, cortisol, glucagon **D-** thyroid stimulating hormone, adrenocorticotropic hormone, follicle-stimulating hormone
- **16-**Which of the following is a sequence of nucleotides in the template strand of a DNA molecule that is transcribed into a codon but then its not translated?
- **A-**TAC
- **B-** ACT
- C- ATC
- **D-** both (B and C) are correct
- **17-**Which of the following is **incorrect** regarding the cylinders in the structure of a long bone?
- **A-** contains vellow bone marrow. **C-** it is a part of the compact bone.
- **B-** consists of lamellae.
- **D-** In the center of each cylinder there is a Haversian canal

- **18-**The tissue that forms the outer layer of blood vessels differs from the tissue that forms the inner layer of blood vessels in that the tissue that forms the outer layer of blood vessels -
- **A-** its cells are characterized by cells that are embedded in large amounts of an intercellular substance
- **B-** is a connective tissue

correct?

- **C-** is an epithelial tissue
- **D-** both (A and B) are correct
- 19-The adjacent table shows the results of mixing several blood samples, which result in the following table is

	Sample 1 (Donor)	Sample 2 (Recipient)	The result (the slide shape)
Α	A -	A ⁺	
С	0-	AB+	

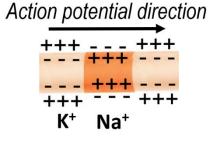
		Sample 2 (Recipient)	The result (the slide shape)
В	AB-	O+	
D	B-	AB ⁻	

- **20-**.....is a molecule that initiates changes inside a cell in response to the binding of a specific substance to a receptor on the outside (surface) of a cell?
- A- first messenger. B- receptor protein.
- **21-**According to Mendel's experiments on pea plants, which of the following represents cross-pollination?
- **C-** second messenger. **D-** hormone-receptor complex
- C- TT × TT A- Tt × Tt **B-** TT × tt
- **22-**All of the following is correct regarding the pivot joint, **EXCEPT**: -

D- All of them are correct

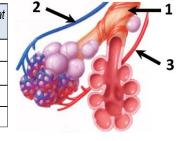
- **A-** it is a type of a movable joint.
- **B-** it allows the body to bend and twist. **D-** it is found in the axial skeleton
- **C-** it is found in the vertebral column.
- **23**-During the first trimester:
- **A-** primary germ layers do not form. **B-** the four embryonic membranes are not formed
- **C-** the mother does not feel the movement of the fetus.
- **D-** the heart does not start beating
- **24-**All of the following secrete a fluid that reduces(decreases) friction, **EXCEPT**: -
- **A-** pleura **B-** diaphragm **C-** the tissue that lines the surfaces of the knee joint
 - **D-** pericardium
- **25-**The adjacent figure shows a part of the neuron axon, which of the following is correct regarding the movement of ions in their specific places on the figure across the neuron axon membrane?

	The movement of ions in their specific places on the figure across the neuron axon membrane
Α	Sodium and potassium ions exit from the nerve cell
В	Sodium and potassium ions enter the nerve cell
С	Sodium ions exit from the nerve cell and potassium ions enter the nerve cell
D	Sodium ions enter the nerve cell and potassium ions exit from the nerve cell



26-Based on the adjacent figure, choose the correct answer from the following table: -

	The blood in the blood vessel that is labeled by number 2: -	The blood in the blood vessel that is labeled by number 3: -	During exhalation the air in the structure that is labeled by number 1 passes into the: -
Α	comes from the right ventricle	returns to the left atrium	alveoli
В	returns to the left atrium	comes from the right ventricle	bronchus
С	comes from the right ventricle	returns to the left atrium	bronchus
D	returns to the right ventricle	comes from the left atrium	alveoli



- **27-**Which of the following is correct regarding the diastole phase?
- **A-** The direction of blood movement is from the atria to the ventricles.
- **B-** It is represented by the P wave in the electrocardiograph (ECG).
- **C-** It takes longer than the atrial contraction phase. **D-** Blood flows to fill the ventricles
- **28**-Antibodies bind to pathogens stopping their activity and destroying them: -
- A- Indirectly by the specific defenses B- by preventing them from entering a cell, thereby blocking its reproduction.
- **C-** by creating holes in the membranes of pathogen infected cells
- **D-** All of them are correct

29 -White blood cells are able to perform their function because: A- they are capable of secreting blood clotting enzymes. B- they are formed in the red bone marrow
C- they can squeeze their way through openings in the walls of blood vessels into the intercellular fluid. D- their nucleus and organelles disappear
30-All of the following are bones of the appendicular skeleton, <u>EXCEPT</u> : - A- clavicle B- sternum C- fibula D- scapula
31-Which of the following secretes estrogen?
A- the mature egg B- corpus luteum C- growing umbilical cord D- All of them are correct
32 -The motor division of the peripheral nervous system controls: - A- skeletal muscle movement B- regulating smooth muscles C- secretion of all of the body's hormones directly D- both (A and B) are correct
33-Which of the following always presenting new antigens?
A- rhinoviruses B- flu viruses C-HIV D- All of them are correct
34 -Which of the following defenses targets a specific type of pathogen? A- mucous membranes B- inflammatory response C- specific defenses D- temperature response
35-In which of the following states the adrenaline is released? A-low blood glucose concentration
B-when a person is stressed C-after the threat period has passed. D- both (A and B) are correct
 36-The receptors that have tiny particles of calcium carbonate on top of them, are known as:- A- mechanoreceptors. B- pain receptors. C- chemoreceptors. D- photoreceptors
37-Which of the following is correct regarding the vas deference?
A- it loops around the urethra. B- each normal male person has two D- all of them are correct
38-In Mendelian genetics, an allele (factor) is considered as a dominant if:
A- able to express itself only in the homozygous state B- able to express itself only in the heterozygous state
C- able to mask the effect of the other allele (factor) in the heterozygous state D- blending of two alleles occurs in the heterozygous state
39-vesicles fuse with the presynaptic membrane when?
A- neurotransmitters are broken down by enzymes. Population potential reaches the even terminal of the presynantia neuron
B- an action potential reaches the axon terminal of the presynaptic neuron C- neurotransmitters are reabsorbed by a postsynaptic cell. D- the sodium-potassium pump is activated
40- The two adjacent figures represent the results of the Hershey and Chase experiments,
in which experiment they used ³⁵ S and in which experiment they used ³² P?
A- In the first experiment they used ³⁵ S, in the second experiment they used ³² P
B- in the first experiment they used ³² P, in the second experiment they used ³⁵ S
C- in both experiments they used ³⁵ S
D- in both experiments they used ³² P Experiment 1 Experiment 2
41-At which step of translation does the last tRNA leave the ribosome?
A- elongation B- initiation C- termination D- disassembly
42- Which of the following is correct regarding the structure of a DNA molecule? 1.the number of sugar molecules is equal to the number of the phosphate group molecules.
2. each nucleotide can differ from another nucleotide only in the type of nitrogenous base.
3.the nitrogenous base is connected to the phosphate group directly by a covalent bond.
A-1 , 2. B-1 , 3 C-2 , 3 D-1 , 2, 3
43-Test cross determines the genotype of any individual who expresses the:
A- dominant phenotype. B- recessive phenotype D- intermediate phenotype
44 -In a dihybrid cross between two pea plants, one has short stem and axial flowers and the other is unknown for
both traits, these ratios produced (1 short stem plant and axial flowers: 1 short stem plant and terminal flowers),
which of the following represents the phenotype of the unknown plant:-
A- short stem and terminal flowers B- tall stem and terminal flowers D tall stem and exial flowers
C- short stem and axial flowers D-tall stem and axial flowers

- **45-**The promoter differs from the start codon in that the promoter: -
- **A-** is a specific nucleotide sequence of DNA.
- **B-** DNA polymerase binds to it
- **C-** indicates where translation should begin
- **D-** both (A and B) are correct
- **46-**In the 28-day period of the ovarian and menstrual cycles, which of the following occurs one after the other (in sequence)? (1- Secretion of follicle-stimulating hormone, 2- Formation of corpus luteum, 3- Growth and development of the follicle, 4- Ovulation, 5- The sharp rise in the concentration of luteinizing hormone)
- A-2 > 1 > 3 > 5 > 4C-3 > 1 > 2 > 5 > 4

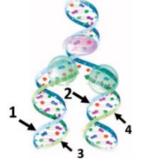
- **D-**1 3 2 5 4
- 47-According to the adjacent codon table, if this DNA sequence (CTCAAGTGCTTC) complements the strand that serves as a template to make mRNA, which of the following polypeptides is produced?
- **A-** Leucine Tyrosine Arginine Phenylalanine
- **B-** Valine Aspartic Acid Proline Histidine
- **C-** Leucine Lysine Cysteine Phenylalanine
- **D-** Proline Glutamic Acid Leucine valine

Codons	Codons in mRNA						
First bas	е	Secon	d base		Third base		
	U	С	Α	G			
U	Phenylalanine	Serine	Tyrosine	Cysteine	U		
	Phenylalanine	Serine	Tyrosine	Cysteine	C		
	Leucine	Serine	Stop	Stop	A		
	Leucine	Serine	Stop	Tryptophan	G		
С	Leucine	Proline	Histidine	Arginine	U		
	Leucine	Proline	Histidine	Arginine	C		
	Leucine	Proline	Glutamine	Arginine	A		
	Leucine	Proline	Glutamine	Arginine	G		
Α	Isoleucine	Threonine	Asparagine	Serine	U		
	Isoleucine	Threonine	Asparagine	Serine	C		
	Isoleucine	Threonine	Lysine	Arginine	A		
	Methionine (start)	Threonine	Lysine	Arginine	G		
G	Valine	Alanine	Aspartic acid	Glycine	U		
	Valine	Alanine	Aspartic acid	Glycine	C		
	Valine	Alanine	Glutamic acid	Glycine	A		
	Valine	Alanine	Glutamic acid	Glycine	G		

- **48**-Which of the following is **incorrect** regarding the process of protein synthesis in eukaryotes?
- **A-**by using the codon table, the codon GCU specifies the amino acid alanine in the genetic code of all living organisms
- **B-** In the transcription, a part of one of the two DNA strands is used to transcribe tRNA
- **C-** The translation can begin even before transcription has finished **D-** transcription takes place in the nucleus.
- 49-In a monohybrid cross, if half of the resulting offspring show the dominant trait, the genotype of the parents: -
- **A-** both are heterozygous. **B-** one is heterozygous and the other is homozygous dominant **D-** both are homozygous
- **C-** one is heterozygous and the other is recessive.
- **50-** According to the adjacent figure that shows the process of DNA replication, after

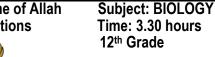
completing this process, which of the choices in the following table is correct regarding the ratio of pyrimidines and the ratio of purines?		 1 3	The ratio of pyrimidines in theis NOT EQUAL to	tł
		•	•	

	The ratio of pyrimidines in theis equal to the ratio of purines in the	The ratio of pyrimidines in theis <u>NOT EQUAL</u> to the ratio of purines in the
Α	Strand 2 , strand 4	Strand 1 , strand 3
В	Strand 1 , strand 4	Strand 2 , strand 4
С	Strand 2 , strand 3	Strand 3 , strand 4
D	Strand 1 , strand 3	Strand 2 , strand 3



Kurdistan Region Government- Irag In the Name of Allah Ministry of Education-High Committee of General Examinations

General exams for preparatory stage (Scientific) For the academic year (2024-2025) Second Sitting





Note: choose the correct answer: - (2 marks for each right answer)

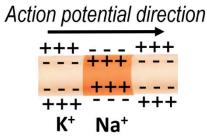
- **1-**In Mendelian genetics, an allele (factor) is considered as a dominant if:
- **A-** able to express itself only in the homozygous state **B-** able to express itself only in the heterozygous state
- **C-** able to mask the effect of the other allele (factor) in the heterozygous state
- **D-** blending of two alleles occurs in the heterozygous state
- **2-**The motor division of the peripheral nervous system controls: -A- skeletal muscle movement
- **B-** regulating smooth muscles **C-** secretion of all of the body's hormones directly **D-** both (A and B) are correct
- **3-**During the first trimester:
- **A-** primary germ layers do not form. **B-** the four embryonic membranes are not formed
- **C-** the mother does not feel the movement of the fetus. **D-** the heart does not start beating
- **4-**All of the following are bones of the appendicular skeleton. **EXCEPT**: -C- fibula **D-** scapula
- **A-** clavicle **B-** sternum
- **5**-Skeletal muscles: **A-** are not attached to the periosteum.
- **B-** are directly attached to the periosteum.
- **C-** are attached to the periosteum by a tendon.
- **D-** both (B and C) are correct
- **6-**Which of the following is **incorrect** regarding the cylinders in the structure of a long bone?
- **B-** consists of lamellae. **A-** contains yellow bone marrow.
- **C-** it is a part of the compact bone. **D-** In the center of each cylinder there is a Haversian canal
- **7-**All of the following is correct regarding the pivot joint, **EXCEPT**: -
- **A-** it is a type of a movable joint.
- **B-** it allows the body to bend and twist.
- **C-** it is found in the vertebral column. **D-** it is found in the axial skeleton
- 8-Which of the following always presenting new antigens?
- **A-** rhinoviruses **B-** flu viruses
- C-HIV
- **D-** All of them are correct
- **9-**White blood cells are able to perform their function because:
- **A-** they are capable of secreting blood clotting enzymes. **B-** they are formed in the red bone marrow
- **C-** they can squeeze their way through openings in the walls of blood vessels into the intercellular fluid.
- **D-** their nucleus and organelles disappear
- 10-The tissue that forms the outer layer of blood vessels differs from the tissue that forms the inner layer of blood vessels in that the tissue that forms the outer layer of blood vessels -
- **A-** its cells are characterized by cells that are embedded in large amounts of an intercellular substance **C-** is an epithelial tissue **D-** both (A and B) are correct
- **B-** is a connective tissue
- **11-**Which of the following secretes estrogen? **A-** the mature egg
 - **B-** corpus luteum
- **C-** growing umbilical cord
- **D-** All of them are correct

- **12-**The smooth muscle:
- **A-** is found in the female reproductive tract.
- **B-** is arranged in opposing pairs.
- **C-** its muscle fibers are not surrounded by connective tissue. **D-** has both origin and insertion points **13-**In which of the following states the adrenaline is released? **A-**low blood glucose concentration
- **B-**when a person is stressed **C-**after the threat period has passed. **D-** both (A and B) are correct
- **14-**In which principle of Koch's postulates principles, the pathogen is grown in the laboratory?
- **A-**1 and 3.
- **B-**2 and 4
- **C-1** and 2.
- **D-**3 and 4.
- **15**-Which part of the cerebrum interprets touch information? **A**-cerebral cortex **B-** diencephalon. **C-** midbrain. **D-** the part of the cerebrum that lies beneath the surface of the cerebral cortex
- **16-**Which of the following is correct regarding the secondary immune response when a person is infected with the same pathogen for the second time?
- **A-** protects the person from infecting with a new pathogen. **B-** memory cells are produced for the first time. **C-** memory cells immediately recognize it and begin to divide rapidly **D-** both (B and C) are correct
- **17-**Which of the following secretes testosterone?
- A- testis
- **B-** seminal vesicles
- C- prostate gland
- **D-** All of them are incorrect

- **18-**Natural killer cells differ from neutrophils in that natural killer cells: -
- **A-** are white blood cells.

- **B-** contribute to general defenses.
- **C-** attack pathogen-infected cells with the pathogen. **D-** Ingest pathogens
- 19-Which of the following is a sequence of nucleotides in the template strand of a DNA molecule that is transcribed into a codon but then its not translated?
- **A-**TAC
- **B-** ACT
- C- ATC
- **D-** both (B and C) are correct
- **20-**The secretory cells and target cells of which of the following hormones are part of the same organ?
- A- secretin
 - **B-** gastrin
- **C-** parathyroid
- **D-** calcitonin
- **21-**The receptors that have tiny particles of calcium carbonate on top of them, are known as:-
- **B-** pain receptors. **C-** chemoreceptors. **D-** photoreceptors **A-** mechanoreceptors.
- **22-**The adjacent figure shows a part of the neuron axon, which of the following is correct regarding the movement of ions in their specific places on the figure across the neuron axon membrane?

	The movement of ions in their specific places on the figure across the neuron axon membrane
Α	Sodium and potassium ions exit from the nerve cell
В	Sodium and potassium ions enter the nerve cell
С	Sodium ions exit from the nerve cell and potassium ions enter the nerve cell
D	Sodium ions enter the nerve cell and potassium ions exit from the nerve cell



23-The adjacent table shows the results of mixing several blood samples, which result in the following table is

correct?

	Sample 1 (Donor)	Sample 2 (Recipient)	The result (the slide shape)
Α	A -	A ⁺	
С	O-	AB+	

		Sample 2 (Recipient)	The result (the slide shape)
В	AB ⁻	O+	
D	B ⁻	AB ⁻	

- **24-**Rods differ from cones in that, rods: **A-**are stimulated by bright light **B-** contain rhodopsin. **C-** initiate the production of sharp colors. **D-** respond to different colors
- **25-**In which of the following crosses, the genotype ratio of homozygous and heterozygous is equal to 1:1: -
- **A-** monohybrid cross (heterozygous × heterozygous) **B-** monohybrid cross (heterozygous × heterozygous)
- **C-** incomplete dominance (heterozygous × heterozygous) **D-** All of them are correct **26-**.....is a molecule that initiates changes inside a cell in response to the binding of a specific substance
- to a receptor on the outside (surface) of a cell? **A-** first messenger. **B-** receptor protein. **C-** second messenger. **D-** hormone-receptor complex
- **27-**Which of the following is correct regarding the diastole phase?
- **A-** The direction of blood movement is from the atria to the ventricles.
- **B-** It is represented by the P wave in the electrocardiograph (ECG).
- **C-** It takes longer than the atrial contraction phase. **D-** Blood flows to fill the ventricles
- **28**-According on the adjacent figure that shows the endometrium, maternal portion of placenta, and the fetal portion of placenta, choose the correct answer from the following:-
- **A-** numbers 1 and 2 point to maternal veins,
- **B-** numbers 1 and 2 point to maternal arteries.
- **C-** number 1 points to an umbilical vein, and number 2 points a maternal vein
- **D-** number 1 points to a maternal vein and the number 2 points to an umbilical artery
- **29-**All of the following groups have a hormone that the site of secretion does not belong to them, EXCEPT: -
- **A-** insulin, prostaglandin, glucagon. **B-** oxytocin, epinephrine, antidiuretic hormone **C-** aldosterone, cortisol, glucagon
- **D-** thyroid stimulating hormone, adrenocorticotropic hormone, follicle-stimulating hormone

30- All of the following occur A- formation of morula			D- formation of first polar body	42- In the 28-day period of the ovarian and median converses (1. Secretion of follows at my
31- Antibodies bind to pathog A- Indirectly by the specific	gens stopping their activity defenses B- by preven	and destroying them: -	thereby blocking its reproduction.	(in sequence)? (1- Secretion of follicle-stimul development of the follicle, 4- Ovulation, 5- Transport of the follicle in the following forms of the following
	er removing cocaine from	n the synapse and dopamin	e release returns to normal, is under stimulated	C- 3 1 2 5 4
C- the number of receptor 33-According to Mendel's a A- Tt × Tt B- TT × t 34-vesicles fuse with the p A- neurotransmitters are	r proteins on the postsyrexperiments on pea plantt C- TT × TT bresynaptic membrane w broken down by enzyme	naptic cell decreases. D nts, which of the following re D- All of them are of when? es.	both (B and C) are correct epresents cross-pollination?	43-According to the adjacent codon table, if the sequence (CTCAAGTGCTTC) complements strand that serves as a template to make mRNA, which of the following polypeptides is produced?
	reabsorbed by a postsyi	naptic cell. D- the sodium	-potassium pump is activated	A- Leucine – Tyrosine –Arginine – Phenylal
35-Which of the following in A- it loops around the ure C- transports semen to the C- transports of the following in the control of the following in the control of the con	thra. e urethra.	B- each normal male po D- all of them are corre		 B- Valine – Aspartic Acid – Proline – Histidi C- Leucine – Lysine – Cysteine – Phenylala D- Proline – Glutamic Acid – Leucine – valir
37- All of the following secr	B- inflammatory respon rete a fluid that reduces(se C- specific defenses	<u>T</u> : -	 44-The promoter differs from the start codon A- is a specific nucleotide sequence of DNA C- indicates where translation should begin
38-Which of the following blo A- both superior and inferio	ood vessels contains (tran or vena cava B- Pulmona	sports) dark red blood? ry veins C- Pulmonary arter	y D- both (A and C) are correct	45- In a dihybrid cross between two pea plants, of the following represents the phenotype
The blood in the blood vessel	The blood in the blood vessel	During exhalation the air in the structure that	2 // // 1	A- short stem and terminal flowers C- short stem and axial flowers
that is labeled by number 2: - A comes from the right ventricle	that is labeled by number 3: - returns to the left atrium	is labeled by number 1 passes into the: - alveoli	Casa	46- Which of the following is incorrect regarding to
B returns to the left atrium	comes from the right ventricle	bronchus	3	A- by using the codon table, the codon GCU spec
C comes from the right ventricle	returns to the left atrium	bronchus		B- In the transcription, a part of one of the two D
D returns to the right ventricle	comes from the left atrium	alveoli		C- The translation can begin even before transcr
40 -The two adjacent figures in which experiment they us	·		ments,	47 -At which step of translation does the last A - elongation B - initiation
1	· .	d experiment they used ³² P		48-Test cross determines the genotype of an A- dominant phenotype.
B- in the first experiment th	ey used 32 P, in the secon	d experiment they used ³⁵ S		C- dominant phenotype and recessive phen
C- in both experiments they	/ used ³⁵ S			49-Which of the following is correct regarding
D- in both experiments they			Experiment 1 Experiment 2	1.the number of sugar molecules is equal to
41 - According to the adjacent	t figure that shows the prod	ess of DNA replication, after		2. each nucleotide can differ from another n

The ratio of pyrimidines in the....is NOT EQUAL to the

ratio of purines in the

Strand 1 . strand 3

Strand 2 , strand 4

Strand 2 . strand 3

strand 4

Strand 3,

completing this process, which of the choices in the following table is correct

regarding the ratio of pyrimidines and the ratio of purines?

strand 3

The ratio of pyrimidines in the....is equal to the ratio of

purines in the ...

В

С

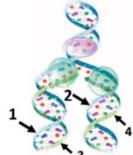
D

Strand 2 . strand 4

Strand 1 , strand 4

Strand 2 , strand 3

Strand 1 .



the 28-day period of the ovarian and menstrual cycles, which of the following occurs one after the other sequence)? (1- Secretion of follicle-stimulating hormone, 2- Formation of corpus luteum, 3- Growth and elopment of the follicle, 4- Ovulation, 5- The sharp rise in the concentration of luteinizing hormone)

Second base

Tyrosine

Glutamine

Third base

Tryptoph

ccording to the adjacent codon table, if this DNA nuence (CTCAAGTGCTTC) complements the and that serves as a template to make NA, which of the following polypeptides

roduced?

∟eucine – Tyrosine –Arginine – Phenylalanine

Valine – Aspartic Acid – Proline – Histidine

eucine – Lysine – Cysteine – Phenylalanine

The promoter differs from the start codon in that the promoter: -

is a specific nucleotide sequence of DNA.

B- DNA polymerase binds to it

D- both (A and B) are correct

Codons in mRNA

First base

C

Α

G

a dihybrid cross between two pea plants, one has short stem and axial flowers and the other is unknown for traits, these ratios produced (1 short stem plant and axial flowers: 1 short stem plant and terminal flowers), ch of the following represents the phenotype of the unknown plant:-

B- tall stem and terminal flowers

D-tall stem and axial flowers

Vhich of the following is **incorrect** regarding the process of protein synthesis in eukaryotes?

y using the codon table, the codon GCU specifies the amino acid alanine in the genetic code of all living organisms

In the transcription, a part of one of the two DNA strands is used to transcribe tRNA

The translation can begin even before transcription has finished **D-** transcription takes place in the nucleus.

t which step of translation does the last tRNA leave the ribosome?

C- termination

D- disassembly

est cross determines the genotype of any individual who expresses the: -

B- recessive phenotype

dominant phenotype and recessive phenotype

D- intermediate phenotype

Vhich of the following is correct regarding the structure of a DNA molecule?

e number of sugar molecules is equal to the number of the phosphate group molecules.

ach nucleotide can differ from another nucleotide only in the type of nitrogenous base. 3.the nitrogenous base is connected to the phosphate group directly by a covalent bond.

A-1. 2.

B- 1. 3

C- 2. 3

D- 1. 2. 3

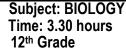
50-In a monohybrid cross, if half of the resulting offspring show the dominant trait, the genotype of the parents: -**A-** both are heterozygous. **B-** one is heterozygous and the other is homozygous dominant

C- one is heterozygous and the other is recessive.

D- both are homozygous

Kurdistan Region Government- Irag In the Name of Allah Ministry of Education-High Committee of General Examinations

General exams for preparatory stage (Scientific) For the academic year (2024-2025) Second Sitting

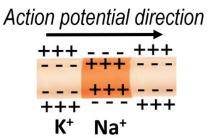




Note: choose the correct answer: - (2 marks for each right answer)

1-The adjacent figure shows a part of the neuron axon, which of the following is correct regarding the movement of ions in their specific places on the figure across the neuron axon membrane?

		, ,
		The movement of ions in their specific places on the figure across the neuron axon membrane
1	4	Sodium and potassium ions exit from the nerve cell
ı	3	Sodium and potassium ions enter the nerve cell
	2	Sodium ions exit from the nerve cell and potassium ions enter the nerve cell
)	Sodium ions enter the nerve cell and potassium ions exit from the nerve cell



2-During the first trimester:

A- primary germ layers do not form. **B-** the four embryonic membranes are not formed

C- the mother does not feel the movement of the fetus.

D- the heart does not start beating

3-The adjacent table shows the results of mixing several blood samples, which result in the following table is

correct?

		Sample 2 (Recipient)	The result (the slide shape)
Α	A -	A ⁺	
С	O-	AB+	

	Sample 1 (Donor)	Sample 2 (Recipient)	The result (the slide shape)
В	AB-	O+	
D	B-	AB⁻	

4-All of the following occur in the fallopian tube. **EXCEPT**: -

A- formation of morula **B-** formation of zygote

C- meiosis *II* of the egg **D-** formation of first polar body

5-Which of the following is a sequence of nucleotides in the template strand of a DNA molecule that is transcribed into a codon but then its not translated?

A-TAC

B- ACT

C- ATC

D- both (B and C) are correct

6-In which of the following crosses, the genotype ratio of homozygous and heterozygous is equal to 1:1: -

A- monohybrid cross (heterozygous × heterozygous) **B-** monohybrid cross (heterozygous × heterozygous)

C- incomplete dominance (heterozygous × heterozygous) D- All of them are correct

7-Which of the following is correct regarding the diastole phase?

A- The direction of blood movement is from the atria to the ventricles.

B- It is represented by the P wave in the electrocardiograph (ECG).

C- It takes longer than the atrial contraction phase. **D-** Blood flows to fill the ventricles

8-Which of the following secretes estrogen?

C- growing umbilical cord **A-** the mature egg **B-** corpus luteum

D- All of them are correct

9-In Mendelian genetics, an allele (factor) is considered as a dominant if:

A- able to express itself only in the homozygous state **B-** able to express itself only in the heterozygous state

C- able to mask the effect of the other allele (factor) in the heterozygous state

D- blending of two alleles occurs in the heterozygous state

10-vesicles fuse with the presynaptic membrane when?

A- neurotransmitters are broken down by enzymes.

B- an action potential reaches the axon terminal of the presynaptic neuron

C- neurotransmitters are reabsorbed by a postsynaptic cell. **D-** the sodium-potassium pump is activated

11-White blood cells are able to perform their function because:

A- they are capable of secreting blood clotting enzymes. **B-** they are formed in the red bone marrow

C- they can squeeze their way through openings in the walls of blood vessels into the intercellular fluid.

D- their nucleus and organelles disappear

12-Which part of the cerebrum interprets touch information? **A-** cerebral cortex **B-** diencephalon. **C-** midbrain. **D-** the part of the cerebrum that lies beneath the surface of the cerebral cortex

13-The smooth muscle:

A- is found in the female reproductive tract.

B- is arranged in opposing pairs.

C- its muscle fibers are not surrounded by connective tissue. **D-** has both origin and insertion points

14-Which of the following defenses targets a specific type of pathogen?

A-mucous membranes **B-**inflammatory response **C-**specific defenses **D-**temperature response

15-Which of the following blood vessels contains (transports) dark red blood?

A- both superior and inferior vena cava **B-** Pulmonary veins **C-** Pulmonary artery **D-** both (A and C) are correct

16-Which of the following is **incorrect** regarding the cylinders in the structure of a long bone?

A- contains yellow bone marrow.

B- consists of lamellae.

C- it is a part of the compact bone. **D-** In the center of each cylinder there is a Haversian canal

17-According to Mendel's experiments on pea plants, which of the following represents cross-pollination?

C- TT × TT **D-** All of them are correct A- Tt × Tt **B-** TT × tt

18-The secretory cells and target cells of which of the following hormones are part of the same organ? **C-** parathyroid **D-** calcitonin A- secretin **B-** gastrin

19-Antibodies bind to pathogens stopping their activity and destroying them: -

A- Indirectly by the specific defenses **B-** by preventing them from entering a cell, thereby blocking its reproduction.

C- by creating holes in the membranes of pathogen infected cells **D-** All of them are correct

20-All of the following groups have a hormone that the site of secretion does not belong to them, EXCEPT: -

A- insulin, prostaglandin, glucagon. **B-** oxytocin, epinephrine, antidiuretic hormone **C-** aldosterone, cortisol, glucagon **D-** thyroid stimulating hormone, adrenocorticotropic hormone, follicle-stimulating hormone

21-Natural killer cells differ from neutrophils in that natural killer cells: -

A- are white blood cells.

B- contribute to general defenses.

C- attack pathogen-infected cells with the pathogen.

D- Ingest pathogens

22-Skeletal muscles:

A- are not attached to the periosteum.

B- are directly attached to the periosteum.

C- are attached to the periosteum by a tendon.

D- both (B and C) are correct 23-Which of the following is correct regarding the secondary immune response when a person is infected

with the same pathogen for the second time? **A-** protects the person from infecting with a new pathogen. **B-** memory cells are produced for the first time.

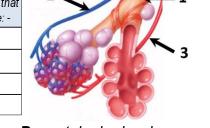
C- memory cells immediately recognize it and begin to divide rapidly **D-** both (B and C) are correct

24-In which of the following states the adrenaline is released? **A-**low blood glucose concentration **C-**after the threat period has passed. **D-** both (A and B) are correct **B-**when a person is stressed

25-The receptors that have tiny particles of calcium carbonate on top of them, are known as:-**A-** mechanoreceptors. **B-** pain receptors. **C-** chemoreceptors. **D-** photoreceptors

26-Based on the adjacent figure, choose the correct answer from the following table: -

_	2 acca ch are adjacom ngare, eneces are contest anoner nem are reneming to						
		The blood in the blood vessel that is labeled by number 2: -	The blood in the blood vessel that is labeled by number 3: -	During exhalation the air in the structure that is labeled by number 1 passes into the: -			
	Α	comes from the right ventricle	returns to the left atrium	alveoli			
	В	returns to the left atrium	comes from the right ventricle	bronchus			
	С	comes from the right ventricle	returns to the left atrium	bronchus	1		
	D	returns to the right ventricle	comes from the left atrium	alveoli			



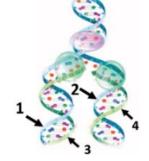
27-Rods differ from cones in that, rods: - **A-**are stimulated by bright light **C-** initiate the production of sharp colors. **D-** respond to different colors

B- contain rhodopsin.

28-According on the adjacent figure that shows the endometrium, maternal portion of placenta, and the fetal portion of placenta, choose the correct answer from the following:- A- numbers 1 and 2 point to maternal veins, B- numbers 1 points to an umbilical vein, and number 2 points a maternal vein D- number 1 points to a maternal vein and the number 2 points to an umbilical artery 29-The motor division of the peripheral nervous system controls: - B- regulating smooth muscles C- secretion of all of the body's hormones directly D- both (A and B) are correct 30-Which of the following is correct regarding the vas deference?
A- it loops around the urethra. B- each normal male person has two C- transports semen to the urethra. D- all of them are correct
 31-In an addict person after removing cocaine from the synapse and dopamine release returns to normal, the postsynaptic neuron: - A- is overstimulated B- is under stimulated C- the number of receptor proteins on the postsynaptic cell decreases. D- both (B and C) are correct
 32-Which of the following secretes testosterone? A- testis B- seminal vesicles C- prostate gland D- All of them are incorrect 33-All of the following are bones of the appendicular skeleton, EXCEPT: -
A- clavicle B- sternum C- fibula D- scapula 34-The tissue that forms the outer layer of blood vessels differs from the tissue that forms the inner layer of blood vessels in that the tissue that forms the outer layer of blood vessels -
A- its cells are characterized by cells that are embedded in large amounts of an intercellular substance B- is a connective tissue C- is an epithelial tissue D- both (A and B) are correct 35is a molecule that initiates changes inside a cell in response to the binding of a specific substance
to a receptor on the outside (surface) of a cell? A- first messenger. B- receptor protein. C- second messenger. D- hormone-receptor complex 36- All of the following is correct regarding the pivot joint, EXCEPT : -
A- it is a type of a movable joint. B- it allows the body to bend and twist. C- it is found in the vertebral column. D- it is found in the axial skeleton
37-All of the following secrete a fluid that reduces(decreases) friction, <u>EXCEPT</u> : - A- pleura B- diaphragm C- the tissue that lines the surfaces of the knee joint D- pericardium 38-Which of the following always presenting new antigens?
A- rhinoviruses B- flu viruses C-HIV D- All of them are correct 39-In which principle of Koch's postulates principles, the pathogen is grown in the laboratory? A-1 and 3. B-2 and 4 C-1 and 2. D-3 and 4.
 40-The two adjacent figures represent the results of the Hershey and Chase experiments, in which experiment they used ³⁵S and in which experiment they used ³²P? A- In the first experiment they used ³⁵S, in the second experiment they used ³²P B- in the first experiment they used ³²P, in the second experiment they used ³⁵S C- in both experiments they used ³⁵S
D- in both experiments they used ³² P 41- At which step of translation does the last tRNA leave the ribosome?
A- elongation B- initiation C- termination 42-In the 28-day period of the ovarian and menstrual cycles, which of the following occurs one after the other (in sequence)? (1- Secretion of follicle-stimulating hormone, 2- Formation of corpus luteum, 3- Growth and development of the follicle, 4- Ovulation, 5- The sharp rise in the concentration of luteinizing hormone) A- 2 1 3 5 4 B- 1 3 5 4 2 C- 3 1 2 5 4 D- 1 3 2 5 4

43- According to the adjacent figure that shows the process of DNA replication, after completing this process, which of the choices in the following table is correct regarding the ratio of pyrimidines and the ratio of purines?

	The ratio of pyrimidines in theis equal to the ratio of purines in the	The ratio of pyrimidines in theis <u>NOT EQUAL</u> to the ratio of purines in the
Α	Strand 2 , strand 4	Strand 1 , strand 3
В	Strand 1 , strand 4	Strand 2 , strand 4
С	Strand 2 , strand 3	Strand 3 , strand 4
D	Strand 1 , strand 3	Strand 2 , strand 3



44-In a monohybrid cross, if half of the resulting offspring show the dominant trait, the genotype of the parents:

A- both are heterozygous. **B-** one is heterozygous and the other is homozygous dominant

C- one is heterozygous and the other is recessive.

D- both are homozygous

45-In a dihybrid cross between two pea plants, one has short stem and axial flowers and the other is unknown for both traits, these ratios produced (1 short stem plant and axial flowers: 1 short stem plant and terminal flowers), which of the following represents the phenotype of the unknown plant:-

A- short stem and terminal flowers

B- tall stem and terminal flowers

C- short stem and axial flowers

D-tall stem and axial flowers

Codons in mRNA

46-The promoter differs from the start codon in that the promoter: -

A- is a specific nucleotide sequence of DNA.

B- DNA polymerase binds to it

C- indicates where translation should begin

D- both (A and B) are correct

47-Which of the following is **incorrect** regarding the process of protein synthesis in eukaryotes?

A-by using the codon table, the codon GCU specifies the amino acid alanine in the genetic code of all living organisms

B- In the transcription, a part of one of the two DNA strands is used to transcribe tRNA

C- The translation can begin even before transcription has finished **D-** transcription takes place in the nucleus.

48-Test cross determines the genotype of any individual who expresses the: -

A- dominant phenotype.

C- dominant phenotype and recessive phenotype

B- recessive phenotype **D-** intermediate phenotype

49-According to the adjacent codon table, if this DNA sequence (CTCAAGTGCTTC) complements the strand that serves as a template to make mRNA, which of the following polypeptides is produced?

A- Leucine – Tyrosine – Arginine – Phenylalanine

B- Valine – Aspartic Acid – Proline – Histidine

C- Leucine – Lysine – Cysteine – Phenylalanine

D- Proline – Glutamic Acid – Leucine – valine

First base		Second base		Third base	
	U	С	Α	G	
U	Phenylalanine Phenylalanine Leucine Leucine	Serine Serine Serine Serine	Tyrosine Tyrosine Stop Stop	Cysteine Cysteine Stop Tryptophan	U C A G
С	Leucine Leucine Leucine Leucine	Proline Proline Proline Proline	Histidine Histidine Glutamine Glutamine	Arginine Arginine Arginine Arginine	U C A G
Α	Isoleucine Isoleucine Isoleucine Methionine (start	Threonine Threonine Threonine Threonine	Asparagine Asparagine Lysine Lysine	Serine Serine Arginine Arginine	UCAG
G	Valine Valine Valine Valine	Alanine Alanine Alanine Alanine	Aspartic acid Aspartic acid Glutamic acid Glutamic acid	Glycine Glycine Glycine Glycine	U C A G

50-Which of the following is correct regarding the structure of a DNA molecule?

1.the number of sugar molecules is equal to the number of the phosphate group molecules.

2. each nucleotide can differ from another nucleotide only in the type of nitrogenous base. 3.the nitrogenous base is connected to the phosphate group directly by a covalent bond.

A-1, 2.

B- 1, 3

C- 2. 3

D- 1, 2, 3

Kurdistan Region Government- Irag In the Name of Allah Ministry of Education-High Committee of General Examinations General exams for preparatory stage (Scientific) For the academic year (2024-2025) Second Sitting

Subject: BIOLOGY Time: 3.30 hours 12th Grade



Note: choose the correct answer: - (2 marks for each right answer)

1-Which of the following is a sequence of nucleotides in the template strand of a DNA molecule that is transcribed into a codon but then its not translated?

A-TAC **B-** ACT C- ATC

D- both (B and C) are correct

2-Which part of the cerebrum interprets touch information? **A-** cerebral cortex **B-** diencephalon. **C-** midbrain. **D-** the part of the cerebrum that lies beneath the surface of the cerebral cortex

3-In an addict person after removing cocaine from the synapse and dopamine release returns to normal, the postsynaptic neuron: -**A-** is overstimulated **B-** is under stimulated

C- the number of receptor proteins on the postsynaptic cell decreases. D- both (B and C) are correct

4-The secretory cells and target cells of which of the following hormones are part of the same organ?

A- secretin **B-** gastrin **C-** parathyroid

5-All of the following occur in the fallopian tube, **EXCEPT**: -

A- formation of morula **B-** formation of zygote

C- meiosis II of the egg **D-** formation of first polar body

6-During the first trimester:

A- primary germ layers do not form. **B-** the four embryonic membranes are not formed

C- the mother does not feel the movement of the fetus.

D- the heart does not start beating

D- calcitonin

7-The receptors that have tiny particles of calcium carbonate on top of them, are known as:-

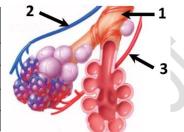
A- mechanoreceptors. **B-** pain receptors. **C-** chemoreceptors. **D-** photoreceptors

8-In which of the following crosses, the genotype ratio of homozygous and heterozygous is equal to 1:1: -

A- monohybrid cross (heterozygous × heterozygous) **B-** monohybrid cross (heterozygous × heterozygous) **C-** incomplete dominance (heterozygous × heterozygous) **D-** All of them are correct

9-Based on the adjacent figure, choose the correct answer from the following table: -

_				
		The blood in the blood vessel that is labeled by number 2: -	The blood in the blood vessel that is labeled by number 3: -	During exhalation the air in the structure that is labeled by number 1 passes into the: -
	Α	comes from the right ventricle	returns to the left atrium	alveoli
	В	returns to the left atrium	comes from the right ventricle	bronchus
	С	comes from the right ventricle	returns to the left atrium	bronchus
ſ	ח	returns to the right ventrials	comes from the left strium	alucali



10-All of the following groups have a hormone that the site of secretion does not belong to them, **EXCEPT**: -

A- insulin, prostaglandin, glucagon. **B-** oxytocin, epinephrine, antidiuretic hormone **C-** aldosterone, cortisol, glucagon

D- thyroid stimulating hormone, adrenocorticotropic hormone, follicle-stimulating hormone

11-Which of the following defenses targets a specific type of pathogen?

A-mucous membranes **B-**inflammatory response **C-**specific defenses **D-**temperature response

12-All of the following is correct regarding the pivot joint. **EXCEPT**: -

A- it is a type of a movable joint.

B- it allows the body to bend and twist.

C- it is found in the vertebral column.

D- it is found in the axial skeleton

13-The tissue that forms the outer layer of blood vessels differs from the tissue that forms the inner layer of blood vessels in that the tissue that forms the outer laver of blood vessels -

A- its cells are characterized by cells that are embedded in large amounts of an intercellular substance

C- is an epithelial tissue **B-** is a connective tissue

14-Which of the following is correct regarding the secondary immune response when a person is infected

D- both (A and B) are correct

with the same pathogen for the second time? **A-** protects the person from infecting with a new pathogen. **B-** memory cells are produced for the first time. **C-** memory cells immediately recognize it and begin to divide rapidly **D-** both (B and C) are correct

15-Which of the following secretes testosterone? **B-** seminal vesicles

C- prostate gland

D- All of them are incorrect

16-According to Mendel's experiments on pea plants, which of the following represents cross-pollination?

 $A-Tt \times Tt$

A- testis

B- TT × tt

C-TT × TT

D- All of them are correct

17-According on the adjacent figure that shows the endometrium, maternal portion of placenta, and the fetal portion of placenta, choose the correct answer from the following:-

A- numbers 1 and 2 point to maternal veins,

B- numbers 1 and 2 point to maternal arteries,

C- number 1 points to an umbilical vein, and number 2 points a maternal vein

D- number 1 points to a maternal vein and the number 2 points to an umbilical artery

18-Antibodies bind to pathogens stopping their activity and destroying them: -

A- Indirectly by the specific defenses **B-** by preventing them from entering a cell, thereby blocking its reproduction.

C- by creating holes in the membranes of pathogen infected cells **D-** All of them are correct

19-Which of the following always presenting new antigens?

B- flu viruses **D-** All of them are correct **A-** rhinoviruses

20-In which principle of Koch's postulates principles, the pathogen is grown in the laboratory? **A-**1 and 3. **B-**2 and 4 **C-1** and 2. **D-**3 and 4.

21-The smooth muscle:

A- is found in the female reproductive tract.

B- is arranged in opposing pairs.

C- its muscle fibers are not surrounded by connective tissue. **D-** has both origin and insertion points

22-Rods differ from cones in that, rods: - **A**-are stimulated by bright light **B**- contain rhodopsin. **C-** initiate the production of sharp colors. **D-** respond to different colors

23-Which of the following is correct regarding the diastole phase?

A- The direction of blood movement is from the atria to the ventricles.

B- It is represented by the P wave in the electrocardiograph (ECG).

C- It takes longer than the atrial contraction phase. D- Blood flows to fill the ventricles

24-White blood cells are able to perform their function because:

A- they are capable of secreting blood clotting enzymes. **B-** they are formed in the red bone marrow

C- they can squeeze their way through openings in the walls of blood vessels into the intercellular fluid.

D- their nucleus and organelles disappear

25-Which of the following secretes estrogen? **A-** the mature egg **B-** corpus luteum

C- growing umbilical cord **D-** All of them are correct

26-vesicles fuse with the presynaptic membrane when?

A- neurotransmitters are broken down by enzymes.

B- an action potential reaches the axon terminal of the presynaptic neuron

C- neurotransmitters are reabsorbed by a postsynaptic cell. **D-** the sodium-potassium pump is activated

27-All of the following secrete a fluid that reduces (decreases) friction, EXCEPT: -

A- pleura B- diaphragm C- the tissue that lines the surfaces of the knee joint **D-** pericardium **28**-Which of the following blood vessels contains (transports) dark red blood?

A- both superior and inferior vena cava **B-** Pulmonary veins **C-** Pulmonary artery **D-** both (A and C) are correct

29-Natural killer cells differ from neutrophils in that natural killer cells: -

A- are white blood cells.

B- contribute to general defenses. **D-** Ingest pathogens

C- attack pathogen-infected cells with the pathogen.

30-The adjacent figure shows a part of the neuron axon, which of the following is correct regarding the movement of ions in their specific places on the figure across the neuron axon membrane?

	The movement of ions in their specific places on the figure across the neuron axon membrane	
Α	Sodium and potassium ions exit from the nerve cell	
В	Sodium and potassium ions enter the nerve cell	1
С	Sodium ions exit from the nerve cell and potassium ions enter the nerve cell	
D	Sodium ions enter the nerve cell and potassium ions exit from the nerve cell	

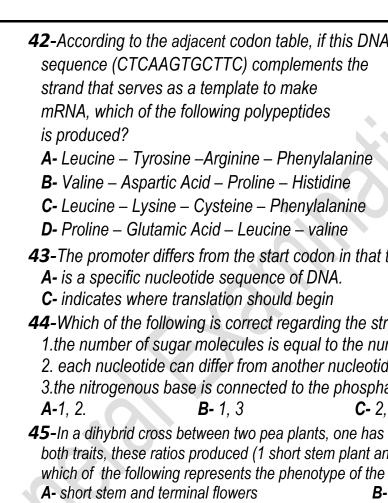
Action potential direction Na⁺

31-The adjacent table shows the results of mixing several blood samples, which result in the following table is correct? Sample 1 Sample 2 The result Sample 1 Sample 2 The result (Donor) (Recipient) (the slide shape) (Donor) (Recipient) (the slide shape) A^{-} A+ В AB^{-} 0+ AB⁺ D B-AB⁻ C O-32-Skeletal muscles: **A-** are not attached to the periosteum. **B-** are directly attached to the periosteum. **D-** both (B and C) are correct **C-** are attached to the periosteum by a tendon. **33**-Which of the following is **incorrect** regarding the cylinders in the structure of a long bone? **A-** contains yellow bone marrow. **B-** consists of lamellae. **C-** it is a part of the compact bone. **D-** In the center of each cylinder there is a Haversian canal **34-**Which of the following is correct regarding the vas deference? **A-** it loops around the urethra. **B-** each normal male person has two **C-** transports semen to the urethra. **D-** all of them are correct **35-**All of the following are bones of the appendicular skeleton, **EXCEPT**: -**B-** sternum **C-** fibula A- clavicle **D-** scapula **36-**In which of the following states the adrenaline is released? **A-**low blood glucose concentration **D-** both (A and B) are correct **B-**when a person is stressed **C-**after the threat period has passed. **37-**In Mendelian genetics, an allele (factor) is considered as a dominant if: **A-** able to express itself only in the homozygous state **B-** able to express itself only in the heterozygous state **C-** able to mask the effect of the other allele (factor) in the heterozygous state **D-** blending of two alleles occurs in the heterozygous state **38-**The motor division of the peripheral nervous system controls: -A- skeletal muscle movement **B-** regulating smooth muscles 'C- secretion of all of the body's hormones directly **D-** both (A and B) are correct **39-**.....is a molecule that initiates changes inside a cell in response to the binding of a specific substance to a receptor on the outside (surface) of a cell? **C-** second messenger. **D-** hormone-receptor complex **A-** first messenger. **B-** receptor protein. **40-**The two adjacent figures represent the results of the Hershey and Chase experiments. in which experiment they used ³⁵S and in which experiment they used ³²P? **A-** In the first experiment they used ³⁵S, in the second experiment they used ³²P **B-** in the first experiment they used ³²P, in the second experiment they used ³⁵S **C-** in both experiments they used ³⁵S **D-** in both experiments they used ³²P Experiment 1 Experiment 2 41-In a monohybrid cross, if half of the resulting offspring show the dominant trait, the genotype of the parents: -

A- both are heterozygous. **B-** one is heterozygous and the other is homozygous dominant

D- both are homozygous

C- one is heterozygous and the other is recessive.



First base		Second base			Third bas	
	U	С	Α	G		
U	Phenylalanine	Serine	Tyrosine	Cysteine	U	
	Phenylalanine	Serine	Tyrosine	Cysteine	C	
	Leucine	Serine	Stop	Stop	A	
	Leucine	Serine	Stop	Tryptophan	G	
С	Leucine	Proline	Histidine	Arginine	U	
	Leucine	Proline	Histidine	Arginine	C	
	Leucine	Proline	Glutamine	Arginine	A	
	Leucine	Proline	Glutamine	Arginine	G	
Α	Isoleucine	Threonine	Asparagine	Serine	U	
	Isoleucine	Threonine	Asparagine	Serine	C	
	Isoleucine	Threonine	Lysine	Arginine	A	
	Methionine (start)	Threonine	Lysine	Arginine	G	
G	Valine	Alanine	Aspartic acid	Glycine	U	
	Valine	Alanine	Aspartic acid	Glycine	C	
	Valine	Alanine	Glutamic acid	Glycine	A	
	Valine	Alanine	Glutamic acid	Glycine	G	

43-The promoter differs from the start codon in that

A- is a specific nucleotide sequence of DNA.

B- DNA polymerase binds to it

D- both (A and B) are correct

44-Which of the following is correct regarding the structure of a DNA molecule?

1.the number of sugar molecules is equal to the number of the phosphate group molecules.

2. each nucleotide can differ from another nucleotide only in the type of nitrogenous base.

3.the nitrogenous base is connected to the phosphate group directly by a covalent bond.

C- 2. 3

D- 1. 2. 3

45-In a dihybrid cross between two pea plants, one has short stem and axial flowers and the other is unknown for both traits, these ratios produced (1 short stem plant and axial flowers: 1 short stem plant and terminal flowers), which of the following represents the phenotype of the unknown plant:-

B- tall stem and terminal flowers

C- short stem and axial flowers

D-tall stem and axial flowers

46-Which of the following is **incorrect** regarding the process of protein synthesis in eukaryotes?

A-by using the codon table, the codon GCU specifies the amino acid alanine in the genetic code of all living organisms

B- In the transcription, a part of one of the two DNA strands is used to transcribe tRNA

C- The translation can begin even before transcription has finished **D-** transcription takes place in the nucleus.

47- According to the adjacent figure that shows the process of DNA replication, after completing this process, which of the choices in the following table is correct regarding the ratio of pyrimidines and the ratio of purines?

	The ratio of pyrimidines in theis equal to the ratio of purines in the	The ratio of pyrimidines in theis <u>NOT EQUAL</u> to the ratio of purines in the
Α	Strand 2 , strand 4	Strand 1 , strand 3
В	Strand 1 , strand 4	Strand 2 , strand 4
С	Strand 2 , strand 3	Strand 3 , strand 4
D	Strand 1 , strand 3	Strand 2 , strand 3
		· · · · · · · · · · · · · · · · · · ·



48-In the 28-day period of the ovarian and menstrual cycles, which of the following occurs one after the other (in sequence)? (1- Secretion of follicle-stimulating hormone, 2- Formation of corpus luteum, 3- Growth and development of the follicle, 4- Ovulation, 5- The sharp rise in the concentration of luteinizing hormone)

C-3 > 1 > 2 > 5 > 4

B- 1	3	5	4	> 2
D- 1	3	2	5	4

49-Test cross determines the genotype of any individual who expresses the: -

A- dominant phenotype.

B- recessive phenotype **D-** intermediate phenotype

C- dominant phenotype and recessive phenotype **50**-At which step of translation does the last tRNA leave the ribosome?

D- disassembly

A- elongation

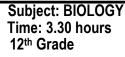
B- initiation

C- termination

Kurdistan Region Government- Irag

In the Name of Allah

Ministry of Education-High Committee of General Examinations General exams for preparatory stage (Scientific) For the academic year (2024-2025) Second Sitting





Note: choose the correct answer: - (2 marks for each right answer)

- **1-**In Mendelian genetics, an allele (factor) is considered as a dominant if:
- **A-** able to express itself only in the homozygous state **B-** able to express itself only in the heterozygous state
- **C-** able to mask the effect of the other allele (factor) in the heterozygous state
- **D-** blending of two alleles occurs in the heterozygous state
- 2-In which of the following crosses, the genotype ratio of homozygous and heterozygous is equal to 1:1: -**A-** monohybrid cross (heterozygous × heterozygous) **B-** monohybrid cross (heterozygous × heterozygous)
- **C-** incomplete dominance (heterozygous × heterozygous) **D-** All of them are correct
- **3-**Which of the following blood vessels contains (transports) dark red blood?
- A- both superior and inferior vena cava B- Pulmonary veins C- Pulmonary artery D- both (A and C) are correct
- **4-**Which of the following defenses targets a specific type of pathogen?

A-mucous membranes **B-**inflammatory response **C-**specific defenses **D-**temperature response **5-**Which of the following secretes testosterone?

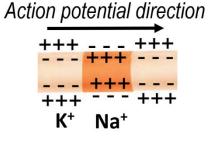
- **B-** seminal vesicles A- testis
- **C-** prostate gland **D-** All of them are incorrect
- **6-**The adjacent table shows the results of mixing several blood samples, which result in the following table is

correct?			Sample 2 (Recipient)	The result (the slide shape
	Α	A -	A ⁺	
	_	0-	ΛR+	

	Sample 1 (Donor)	Sample 2 (Recipient)	The result (the slide shape)
В	AB-	O+	
D	B-	AB ⁻	

- **7-**White blood cells are able to perform their function because:
- **A-** they are capable of secreting blood clotting enzymes. **B-** they are formed in the red bone marrow
- C- they can squeeze their way through openings in the walls of blood vessels into the intercellular fluid.
- **D-** their nucleus and organelles disappear
- **8-**Which of the following always presenting new antigens?
- **A-** rhinoviruses
- **B-** flu viruses
- C-HIV
- **D-** All of them are correct
- **9-**The receptors that have tiny particles of calcium carbonate on top of them, are known as:-**A-** mechanoreceptors. **B-** pain receptors. **C-** chemoreceptors. **D-** photoreceptors
- **10-**All of the following secrete a fluid that reduces(decreases) friction, **EXCEPT**: -
- **A-** pleura **B-** diaphragm **C-** the tissue that lines the surfaces of the knee joint **D-** pericardium
- **11-**Which of the following is correct regarding the secondary immune response when a person is infected with the same pathogen for the second time?
- **A-** protects the person from infecting with a new pathogen. **B-** memory cells are produced for the first time. C- memory cells immediately recognize it and begin to divide rapidly D- both (B and C) are correct
- **12-**The adjacent figure shows a part of the neuron axon, which of the following is correct regarding the movement of ions in their specific places on the figure across the neuron axon membrane?

	The movement of ions in their specific places on the figure across the neuron axon membrane
Α	Sodium and potassium ions exit from the nerve cell
В	Sodium and potassium ions enter the nerve cell
С	Sodium ions exit from the nerve cell and potassium ions enter the nerve cell
D	Sodium ions enter the nerve cell and potassium ions exit from the nerve cell



! 3- During	the	first	trimester:	
--------------------	-----	-------	------------	--

- **A-** primary germ layers do not form. **B-** the four embryonic membranes are not formed
- **C-** the mother does not feel the movement of the fetus. **D-** the heart does not start beating
- **14-**All of the following is correct regarding the pivot joint, **EXCEPT**: -
- **A-** it is a type of a movable joint. **B-** it allows the body to bend and twist. **C-** it is found in the vertebral column. **D-** it is found in the axial skeleton
- 15-All of the following groups have a hormone that the site of secretion does not belong to them, EXCEPT: -
- **A-** insulin, prostaglandin, glucagon. **B-** oxytocin, epinephrine, antidiuretic hormone **C-** aldosterone, cortisol, glucagon
- **D-** thyroid stimulating hormone, adrenocorticotropic hormone, follicle-stimulating hormone
- **16**-Which part of the cerebrum interprets touch information? **A-** cerebral cortex **B-** diencephalon. **C-** midbrain. **D-** the part of the cerebrum that lies beneath the surface of the cerebral cortex
- **17-**.....is a molecule that initiates changes inside a cell in response to the binding of a specific substance to a receptor on the outside (surface) of a cell?
- **A-** first messenger. **B-** receptor protein. **C-** second messenger. **D-** hormone-receptor complex
- **18**-According on the adjacent figure that shows the endometrium, maternal portion of placenta, and the fetal portion of placenta, choose the correct answer from the following:-
- **A-** numbers 1 and 2 point to maternal veins,
- **B-** numbers 1 and 2 point to maternal arteries.
- **C-** number 1 points to an umbilical vein, and number 2 points a maternal vein
- **D-** number 1 points to a maternal vein and the number 2 points to an umbilical artery
- **19-**The smooth muscle:
- **A-** is found in the female reproductive tract.
- **B-** is arranged in opposing pairs.
- **C-** its muscle fibers are not surrounded by connective tissue. **D-** has both origin and insertion points
- **20-**The tissue that forms the outer layer of blood vessels differs from the tissue that forms the inner layer of blood vessels in that the tissue that forms the outer layer of blood vessels -
- A- its cells are characterized by cells that are embedded in large amounts of an intercellular substance **D-** both (A and B) are correct
- **B-** is a connective tissue **C-** is an epithelial tissue **21-**Which of the following secretes estrogen?
- **A-** the mature egg **B-** corpus luteum **C-** growing umbilical cord
- **D-** All of them are correct
- **22-**Which of the following is a sequence of nucleotides in the template strand of a DNA molecule that is transcribed into a codon but then its not translated?
- **A-**TAC B- ACT C- ATC
- **D-** both (B and C) are correct
- 23-Antibodies bind to pathogens stopping their activity and destroying them: -
- **A-** Indirectly by the specific defenses **B-** by preventing them from entering a cell, thereby blocking its reproduction.
- **C-** by creating holes in the membranes of pathogen infected cells **D-** All of them are correct
- **24-**Which of the following is correct regarding the diastole phase?
- **A-** The direction of blood movement is from the atria to the ventricles.
- **B-** It is represented by the P wave in the electrocardiograph (ECG).
- **C-** It takes longer than the atrial contraction phase. **D-** Blood flows to fill the ventricles
- **25**-Rods differ from cones in that, rods: **A**-are stimulated by bright light **B** contain rhodopsin. **C-** initiate the production of sharp colors. **D-** respond to different colors
- **26**-According to Mendel's experiments on pea plants, which of the following represents cross-pollination? C- $TT \times TT$ **B-** TT × tt **D-** All of them are correct A- Tt × Tt
- **27-**Which of the following is **incorrect** regarding the cylinders in the structure of a long bone?
- **A-** contains yellow bone marrow.
- **B-** consists of lamellae.
- **C-** it is a part of the compact bone. **D-** In the center of each cylinder there is a Haversian canal
- 28-All of the following are bones of the appendicular skeleton, EXCEPT: -

B- formation of zygote

A- clavicle

A- formation of morula

- **B-** sternum
- **C-** fibula

- **29-**Skeletal muscles:
- **A-** are not attached to the periosteum.
- **B-** are directly attached to the periosteum. **D-** both (B and C) are correct
- **C-** are attached to the periosteum by a tendon.
- **30-**All of the following occur in the fallopian tube, **EXCEPT**: -

 - **C-** meiosis *II* of the egg **D-** formation of first polar body

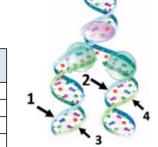
3	31 -The secretory cells and target cells of which of the following hormones are part of the same organ? A- secretin B- gastrin C- parathyroid D- calcitonin							
13	32-vesicles fuse with the presynaptic membrane when?							
ľ	A-	neurotransmitters are b	proken down by enzym	ies.				
	B- an action potential reaches the axon terminal of the presynaptic neuron							
_					-potassium pump is activated			
J		Vhich of the following is t loops around the uret		vas deterence? B- each normal male pe	orson has two			
		ransports semen to the		D- all of them are corre				
l٦				ect answer from the following				
		The blood in the blood vessel		During exhalation the air in the structure that	2 1			
		that is labeled by number 2: -	that is labeled by number 3: -	is labeled by number 1 passes into the: -				
	A	comes from the right ventricle	returns to the left atrium	alveoli	3			
	В	returns to the left atrium	comes from the right ventricle	bronchus				
	С	comes from the right ventricle	returns to the left atrium	bronchus				
	D	returns to the right ventricle	comes from the left atrium	alveoli				
3		he motor division of the			muscle movement			
۱,		= =		f the body's hormones directly	· · · · · · · · · · · · · · · · · · ·			
J		n which of the following Then a person is stress			od glucose concentration D- both (A and B) are correct			
3				om the synapse and dopamin	, ,			
	the	postsynaptic neuron: -	• A- is overstim	ulated B-	is under stimulated			
١				naptic cell decreases. D	•			
3			ch's postulates principi B- 2 and 4	les, the pathogen is grown in C-1 and 2. D- 3	the laboratory? and 4.			
3		latural killer cells differ	from neutrophils in the					
	A- are white blood cells. B- contribute to general defenses.							
	C- attack pathogen-infected cells with the pathogen. D- Ingest pathogens 10. The two adjacent figures represent the results of the Herebey and Change experiments.							
4	40 -The two adjacent figures represent the results of the Hershey and Chase experiments, in which experiment they used ³⁵ S and in which experiment they used ³² P?							
	A- In the first experiment they used ³⁵ S, in the second experiment they used ³² P							
				nd experiment they used ³⁵ S				
		•		nu experiment they used 33				
		n both experiments they			Funnyiment 4 Funnyiment 2			
		n both experiments they			Experiment 1 Experiment 2			
4		-	•	, •	t, the genotype of the parents: -			
	A- both are heterozygous. B- one is heterozygous and the other is homozygous dominant							
l,	C- one is heterozygous and the other is recessive. D- both are homozygous							
4		•	•	structure of a DNA molecule				
	1.the number of sugar molecules is equal to the number of the phosphate group molecules.							
	 each nucleotide can differ from another nucleotide only in the type of nitrogenous base. the nitrogenous base is connected to the phosphate group directly by a covalent bond. 							
	3.u A- 1	•	•	- 2, 3				
4		•	<i>'</i>	nas short stem and axial flowers				
[-	·	t and axial flowers: 1 short sten				
		ch of the following repre			,,			
		short stem and terminal f		B- tall stem and terminal flower	ers			
	C- 8	short stem and axial flow	rers	D- tall stem and axial flowers				
1								

44-In the 28-day period of the ovarian and menstrual cycles, which of the following occurs one after the other (in sequence)? (1- Secretion of follicle-stimulating hormone, 2- Formation of corpus luteum, 3- Growth and development of the follicle, 4- Ovulation, 5- The sharp rise in the concentration of luteinizing hormone)

A-2 > 1 > 3 > 5 > 4

45- According to the adjacent figure that shows the process of DNA replication, after completing this process, which of the choices in the following table is correct regarding the ratio of pyrimidines and the ratio of purines?

1			. 2
		The ratio of pyrimidines in theis equal to the ratio of purines in the	The ratio of pyrimidines in theis <u>NOT EQUAL</u> to the ratio of purines in the
	Α	Strand 2 , strand 4	Strand 1 , strand 3
	В	Strand 1 , strand 4	Strand 2 , strand 4
	С	Strand 2 , strand 3	Strand 3 , strand 4
	D	Strand 1 , strand 3	Strand 2 , strand 3



46-The promoter differs from the start codon in that the promoter: -

A- is a specific nucleotide sequence of DNA.

B- DNA polymerase binds to it

C- indicates where translation should begin

D- both (A and B) are correct

47-At which step of translation does the last tRNA leave the ribosome?

B- initiation **A-** elongation

C- termination

D- disassembly

48-Which of the following is **incorrect** regarding the process of protein synthesis in eukaryotes?

A-by using the codon table, the codon GCU specifies the amino acid alanine in the genetic code of all living organisms

B- In the transcription, a part of one of the two DNA strands is used to transcribe tRNA

C- The translation can begin even before transcription has finished

D- transcription takes place in the nucleus.

49-Test cross determines the genotype of any individual who expresses the: -

A- dominant phenotype.

C- dominant phenotype and recessive phenotype

50-According to the adjacent codon table, if this DNA sequence (CTCAAGTGCTTC) complements the strand that serves as a template to make mRNA, which of the following polypeptides is produced?

A- Leucine – Tyrosine – Arginine – Phenylalanine

B- Valine – Aspartic Acid – Proline – Histidine

C- Leucine – Lysine – Cysteine – Phenylalanine

D- Proline – Glutamic Acid – Leucine – valine

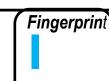
Codons in mRNA					
First bas	е	Secon	d base		Third base
	U	С	Α	G	
U	Phenylalanine Phenylalanine Leucine Leucine	Serine Serine Serine Serine	Tyrosine Tyrosine Stop Stop	Cysteine Cysteine Stop Tryptophan	UCAG
С	Leucine Leucine Leucine Leucine	Proline Proline Proline Proline	Histidine Histidine Glutamine Glutamine	Arginine Arginine Arginine Arginine	U C A G
Α	Isoleucine Isoleucine Isoleucine Methionine (start	Threonine Threonine Threonine Threonine	Asparagine Asparagine Lysine Lysine	Serine Serine Arginine Arginine	U C A G
G	Valine Valine Valine Valine	Alanine Alanine Alanine Alanine	Aspartic acid Aspartic acid Glutamic acid Glutamic acid	Glycine Glycine Glycine Glycine	U C A G

B- recessive phenotype

D- intermediate phenotype

Kurdistan Region Government- Irag In the Name of Allah Ministry of Education-High Committee of General Examinations

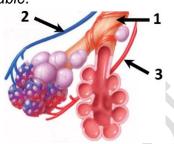
General exams for preparatory stage (Scientific) For the academic year (2024-2025) Second Sitting Subject: BIOLOGY Time: 3.30 hours 12th Grade



Note: choose the correct answer: - (2 marks for each right answer)

- **1-**Which of the following blood vessels contains (transports) dark red blood?
- **A-** both superior and inferior vena cava **B-** Pulmonary veins **C-** Pulmonary artery **D-** both (A and C) are correct
- **2-**Which of the following is **incorrect** regarding the cylinders in the structure of a long bone?
- **A-** contains yellow bone marrow.
- **B-** consists of lamellae.
- **C-** it is a part of the compact bone.
- **D-** In the center of each cylinder there is a Haversian canal
- **3-**Which of the following is correct regarding the secondary immune response when a person is infected with the same pathogen for the second time?
- **A-** protects the person from infecting with a new pathogen. **B-** memory cells are produced for the first time.
- C- memory cells immediately recognize it and begin to divide rapidly D- both (B and C) are correct
- **4-**Rods differ from cones in that, rods: **A-**are stimulated by bright light **B-** contain rhodopsin.
 - **C-** initiate the production of sharp colors. **D-** respond to different colors
- **5-**The motor division of the peripheral nervous system controls: -A- skeletal muscle movement
- **B-** regulating smooth muscles **C-** secretion of all of the body's hormones directly **D-** both (A and B) are correct
- **6-**The receptors that have tiny particles of calcium carbonate on top of them, are known as:-
- **A-** mechanoreceptors. **B-** pain receptors. **C-** chemoreceptors. **D-** photoreceptors
- **7-**All of the following is correct regarding the pivot joint, **EXCEPT**: -
- **A-** it is a type of a movable joint.
- **B-** it allows the body to bend and twist.
- **C-** it is found in the vertebral column.
- **D-** it is found in the axial skeleton
- **8-**Based on the adjacent figure, choose the correct answer from the following table: -

	The blood in the blood vessel that is labeled by number 2: -	The blood in the blood vessel that is labeled by number 3: -	During exhalation the air in the structure that is labeled by number 1 passes into the: -
Α	comes from the right ventricle	returns to the left atrium	alveoli
В	returns to the left atrium	comes from the right ventricle	bronchus
С	comes from the right ventricle	returns to the left atrium	bronchus
D	returns to the right ventricle	comes from the left atrium	alveoli



9-The adjacent table shows the results of mixing several blood samples, which result in the following table is

correct?

	Sample 1 (Donor)	Sample 2 (Recipient)	The result (the slide shape)
Α	A -	A ⁺	
C	0-	AB ⁺	

	Sample 1 (Donor)	Sample 2 (Recipient)	The result (the slide shape)
В	AB-	O ⁺	
D	B-	AB⁻	

- **10-**In Mendelian genetics, an allele (factor) is considered as a dominant if:
- **A-** able to express itself only in the homozygous state **B-** able to express itself only in the heterozygous state
- C- able to mask the effect of the other allele (factor) in the heterozygous state
- **D-** blending of two alleles occurs in the heterozygous state

11-The adjacent figure shows a part of the neuron axon, which of the following is correct regarding the

neuron axon membrane A Sodium and potassium ions exit from the nerve cell B Sodium and potassium ions enter the nerve cell					
B Sodium and potassium ions enter the nerve cell					
C Sodium ions exit from the nerve cell and potassium ions enter the nerve cell +++					
D Sodium ions enter the nerve cell and potassium ions exit from the nerve cell	Na⁺				
A- is found in the female reproductive tract. C- its muscle fibers are not surrounded by connective tissue. B- is arranged in opposing pairs. C- its muscle fibers are not surrounded by connective tissue. B- has both origin and insertion points A-low blood glucose concentration B-when a person is stressed C-after the threat period has passed. D- both (A and B) are correct A- formation of morula B- formation of zygote C- meiosis II of the egg D- formation of first polar body 5-The tissue that forms the outer layer of blood vessels differs from the tissue that forms the inner layer of blood vessels in that the tissue that forms the outer layer of blood vessels - A- its cells are characterized by cells that are embedded in large amounts of an intercellular substance B- is a connective tissue C- is an epithelial tissue D- both (A and B) are correct B- each normal male person has two C- transports semen to the urethra. B- each normal male person has two D- all of them are correct					

- **U-** attack pathogen-intected cells with the pathogen. **D-** Ingest pathogens
- **18-**Which of the following is correct regarding the diastole phase?
- **A-** The direction of blood movement is from the atria to the ventricles.
- **B-** It is represented by the P wave in the electrocardiograph (ECG).
- **C-** It takes longer than the atrial contraction phase. **D-** Blood flows to fill the ventricles
- **19-**In an addict person after removing cocaine from the synapse and dopamine release returns to normal. A- is overstimulated the postsynaptic neuron: -**B-** is under stimulated
- **C-** the number of receptor proteins on the postsynaptic cell decreases. **D-** both (B and C) are correct
- **20-**White blood cells are able to perform their function because:
- **A-** they are capable of secreting blood clotting enzymes. **B-** they are formed in the red bone marrow
- **C-** they can squeeze their way through openings in the walls of blood vessels into the intercellular fluid.
- **D-** their nucleus and organelles disappear
- **21-**Antibodies bind to pathogens stopping their activity and destroying them: -
- **A-** Indirectly by the specific defenses **B-** by preventing them from entering a cell, thereby blocking its reproduction.
- **C-** by creating holes in the membranes of pathogen infected cells
- **D-** All of them are correct

- **22-**During the first trimester:
- **A-** primary germ layers do not form. **B-** the four embryonic membranes are not formed
- **C-** the mother does not feel the movement of the fetus. **D-** the heart does not start beating
- **23**-Which of the following defenses targets a specific type of pathogen?
- **A-**mucous membranes **B-**inflammatory response **C-**specific defenses **D-**temperature response **24**-According to Mendel's experiments on pea plants, which of the following represents cross-pollination?
- **A-** Tt × Tt **B-** TT × tt **C-** TT × TT **D-** All of them are correct
- **25-**The secretory cells and target cells of which of the following hormones are part of the same organ?
- **C-** parathyroid A- secretin **B-** gastrin **D-** calcitonin **26-**Which of the following is a sequence of nucleotides in the template strand of a DNA molecule that is transcribed into a codon but then its not translated?
- **A-**TAC **B-** ACT C- ATC **D-** both (B and C) are correct

27- In which principle of Koch's postulates principles, the pathogen is grown in the laboratory? A- 1 and 3. B- 2 and 4 C- 1 and 2. D- 3 and 4.	42 -According to the adjacent codon table, if this DNA sequence (CTCAAGTGCTTC) complements the
28-According on the adjacent figure that shows the endometrium, maternal portion of placenta, and the fetal portion of placenta, choose the correct answer from the following:- A- numbers 1 and 2 point to maternal veins, B- numbers 1 and 2 point to maternal arteries,	strand that serves as a template to make mRNA, which of the following polypeptides is produced? U Phenylalanine Serine Tyrosine Cysteine Stop Stop Stop Stop Stop Tryptophan Leucine Proline Histidine Arginine Arginine Cysteine Cysteine Stop Stop Stop Tryptophan G Cysteine Cysteine Stop Stop Stop Tryptophan G Cysteine Cysteine Stop Stop Stop Tryptophan G Cysteine Stop Stop Stop Stop Stop Stop Stop Stop
C- number 1 points to an umbilical vein, and number 2 points a maternal vein	A- Leucine – Tyrosine – Arginine – Phenylalanine Leucine Proline Glutamine Arginine Gille Grand Grand
D- number 1 points to a maternal vein and the number 2 points to an umbilical artery	B- Valine — Aspartic Acid — Proline — Histidine A Isoleucine Threonine Lysine Arginine A G G G G G G G G G
29 -vesicles fuse with the presynaptic membrane when? A- neurotransmitters are broken down by enzymes.	C- Leucine — Lysine — Cysteine — Phenylalanine G Valine Alanine Aspartic acid Glycine C C
B- an action potential reaches the axon terminal of the presynaptic neuron	
C- neurotransmitters are reabsorbed by a postsynaptic cell. D- the sodium-potassium pump is activated 30- Skeletal muscles:	43- In a monohybrid cross, if half of the resulting offspring show the dominant trait, the genotype of the parents: - A- both are heterozygous. B- one is heterozygous and the other is homozygous dominant
A- are not attached to the periosteum. B- are directly attached to the periosteum.	C- one is heterozygous and the other is recessive. D- both are homozygous
C- are attached to the periosteum by a tendon. D- both (B and C) are correct	44- Test cross determines the genotype of any individual who expresses the: -
31- Which of the following secretes estrogen? A- the mature egg B- corpus luteum C- growing umbilical cord D- All of them are correct	A- dominant phenotype. B- recessive phenotype
32- All of the following secrete a fluid that reduces(decreases) friction, EXCEPT : -	C- dominant phenotype and recessive phenotype D- intermediate phenotype
A- pleura B- diaphragm C- the tissue that lines the surfaces of the knee joint D- pericardium	45- In the 28-day period of the ovarian and menstrual cycles, which of the following occurs one after the other
33 -All of the following groups have a hormone that the site of secretion <u>does not</u> belong to them, <u>EXCEPT</u> : - A- insulin, prostaglandin, glucagon. B- oxytocin, epinephrine, antidiuretic hormone C- aldosterone, cortisol, glucagon	(in sequence)? (1- Secretion of follicle-stimulating hormone, 2- Formation of corpus luteum, 3- Growth and
D- thyroid stimulating hormone, adrenocorticotropic hormone, follicle-stimulating hormone	development of the follicle, 4- Ovulation, 5- The sharp rise in the concentration of luteinizing hormone) A- 2
34- In which of the following crosses, the genotype ratio of homozygous and heterozygous is equal to 1:1: - A- monohybrid cross (heterozygous × heterozygous) B- monohybrid cross (heterozygous × heterozygous)	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$
C- incomplete dominance (heterozygous × heterozygous) D- All of them are correct 35-Which part of the cerebrum interprets touch information? A- cerebral cortex B- diencephalon.	46- According to the adjacent figure that shows the process of DNA replication, after completing this process, which of the choices in the following table is correct
35 -Which part of the cerebrum interprets touch information? A- cerebral cortex B- diencephalon. C- midbrain. D- the part of the cerebrum that lies beneath the surface of the cerebral cortex	regarding the ratio of pyrimidines and the ratio of purines?
36- All of the following are bones of the appendicular skeleton, <u>EXCEPT</u> : - A- clavicle B- sternum C- fibula D- scapula	The ratio of pyrimidines in theis equal to the ratio of purines in theis NOT EQUAL to the ratio of purines in the
 37-Which of the following always presenting new antigens? A- rhinoviruses B- flu viruses C-HIV D- All of them are correct 	A Strand 2 , strand 4 Strand 3 , strand 3 B Strand 1 , strand 4 Strand 2 , strand 4 C Strand 2 , strand 3 Strand 3 , strand 4
38-Which of the following secretes testosterone?	D Strand 3 Strand 3 Strand 3 3
A- testis B- seminal vesicles C- prostate gland D- All of them are incorrect 39is a molecule that initiates changes inside a cell in response to the binding of a specific substance	47-The promoter differs from the start codon in that the promoter: -
to a receptor on the outside (surface) of a cell?	 A- is a specific nucleotide sequence of DNA. B- DNA polymerase binds to it D- both (A and B) are correct
A- first messenger. B- receptor protein. C- second messenger. D- hormone-receptor complex	48 -At which step of translation does the last tRNA leave the ribosome?
40 -The two adjacent figures represent the results of the Hershey and Chase experiments, in which experiment they used ³⁵ S and in which experiment they used ³² P?	A- elongation B- initiation C- termination D- disassembly
A- In the first experiment they used ³⁵ S, in the second experiment they used ³² P	49-Which of the following is correct regarding the structure of a DNA molecule?
B- in the first experiment they used ³² P, in the second experiment they used ³⁵ S	1.the number of sugar molecules is equal to the number of the phosphate group molecules.
C- in both experiments they used ³⁵ S	each nucleotide can differ from another nucleotide only in the type of nitrogenous base.3.the nitrogenous base is connected to the phosphate group directly by a covalent bond.
D- in both experiments they used ³² P Experiment 1 Experiment 2	A-1 , 2. B-1 , 3 C-2 , 3 D-1 , 2, 3
41- In a dihybrid cross between two pea plants, one has short stem and axial flowers and the other is unknown for	50 -Which of the following is incorrect regarding the process of protein synthesis in eukaryotes?
both traits, these ratios produced (1 short stem plant and axial flowers: 1 short stem plant and terminal flowers), which of the following represents the phenotype of the unknown plant:-	A- by using the codon table, the codon GCU specifies the amino acid alanine in the genetic code of all living organisms B- In the transcription, a part of one of the two DNA strands is used to transcribe tRNA
A- short stem and terminal flowers C- short stem and axial flowers D-tall stem and axial flowers	C- The translation can begin even before transcription has finished D- transcription takes place in the nucleus.

Kurdistan Region Government- Iraq

In the Name of Allah Ministry of Education-High Committee of General Examinations

Subject: BIOLOGY Time: 3.30 hours 12th Grade



Note: choose the correct answer: - (2 marks for each right answer)

1-Which of the following is correct regarding the vas deference?

A- it loops around the urethra.

B- each normal male person has two **D-** all of them are correct

C- transports semen to the urethra.

2-Which of the following is a sequence of nucleotides in the template strand of a DNA molecule that is

transcribed into a codon but then its not translated? **A-**TAC

B- ACT

General exams for preparatory stage (Scientific)

For the academic year (2024-2025) Second Sitting

C- ATC

D- both (B and C) are correct

3-The adjacent table shows the results of mixing several blood samples, which result in the following table is

correct?

		Sample 2 (Recipient)	The result (the slide shape)
Α	A -	A ⁺	
С	0-	AB+	

		Sample 2 (Recipient)	The result (the slide shape)
В	AB ⁻	O ⁺	
D	B-	AB⁻	

4-Skeletal muscles:

A- are not attached to the periosteum.

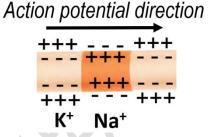
B- are directly attached to the periosteum.

C- are attached to the periosteum by a tendon.

D- both (B and C) are correct

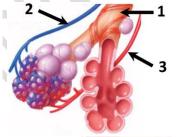
5-The adjacent figure shows a part of the neuron axon, which of the following is correct regarding the movement of ions in their specific places on the figure across the neuron axon membrane?

	The movement of ions in their specific places on the figure across the neuron axon membrane
Α	Sodium and potassium ions exit from the nerve cell
В	Sodium and potassium ions enter the nerve cell
С	Sodium ions exit from the nerve cell and potassium ions enter the nerve cell
D	Sodium ions enter the nerve cell and potassium ions exit from the nerve cell



6-Based on the adjacent figure, choose the correct answer from the following table: -

A comes from the right ventricle returns to the left atrium alveoli B returns to the left atrium comes from the right ventricle bronchus C comes from the right ventricle returns to the left atrium bronchus		The blood in the blood vessel that is labeled by number 2: -	The blood in the blood vessel that is labeled by number 3: -	During exhalation the air in the structure that is labeled by number 1 passes into the: -
C comes from the right ventricle returns to the left atrium bronchus	Α	comes from the right ventricle	returns to the left atrium	alveoli
2 defined from the right ventrale retained to the felt differ.	В	returns to the left atrium	comes from the right ventricle	bronchus
D water a to the sight contribet and from the left atrium.	С	comes from the right ventricle	returns to the left atrium	bronchus
returns to the right ventricle comes from the left atrium arveoli	D	returns to the right ventricle	comes from the left atrium	alveoli



7-According on the adjacent figure that shows the endometrium, maternal portion of placenta, and the fetal portion of placenta, choose the correct answer from the following:-

A- numbers 1 and 2 point to maternal veins,

B- numbers 1 and 2 point to maternal arteries,

C- number 1 points to an umbilical vein, and number 2 points a maternal vein

D- number 1 points to a maternal vein and the number 2 points to an umbilical artery

8-In which of the following states the adrenaline is released? **A-**low blood glucose concentration **B-**when a person is stressed **C-**after the threat period has passed. **D**- both (A and B) are correct

9-Which of the following secretes testosterone?

A- testis **B-** seminal vesicles **C-** prostate gland

D- All of them are incorrect

10-All of the following occur in the fallopian tube, **EXCEPT**: -**A-** formation of morula

B- formation of zygote **C-** meiosis *II* of the egg **D-** formation of first polar body

11-The motor division of the peripheral nervous system controls: - **A-** skeletal muscle movement

B- regulating smooth muscles **C-** secretion of all of the body's hormones directly **D-** both (A and B) are correct

12-In which principle of Koch's postulates principles, the pathogen is grown in the laboratory? **B-**2 and 4 **A-**1 and 3. **C-**1 and 2.

13-Which of the following is correct regarding the diastole phase?

A- The direction of blood movement is from the atria to the ventricles.

B- It is represented by the P wave in the electrocardiograph (ECG).

C- It takes longer than the atrial contraction phase. **D-** Blood flows to fill the ventricles

14-All of the following secrete a fluid that reduces(decreases) friction, **EXCEPT**: -

A- pleura **B-** diaphragm **C-** the tissue that lines the surfaces of the knee joint **D-** pericardium

15-vesicles fuse with the presynaptic membrane when?

A- neurotransmitters are broken down by enzymes.

B- an action potential reaches the axon terminal of the presynaptic neuron

C- neurotransmitters are reabsorbed by a postsynaptic cell. **D-** the sodium-potassium pump is activated

16-Which of the following defenses targets a specific type of pathogen?

A-mucous membranes **B-**inflammatory response **C-**specific defenses **D-**temperature response

17-.....is a molecule that initiates changes inside a cell in response to the binding of a specific substance to a receptor on the outside (surface) of a cell?

C- second messenger. **D-** hormone-receptor complex **A-** first messenger. **B-** receptor protein.

18-White blood cells are able to perform their function because:

A- they are capable of secreting blood clotting enzymes. **B-** they are formed in the red bone marrow

C- they can squeeze their way through openings in the walls of blood vessels into the intercellular fluid.

D- their nucleus and organelles disappear

19-The tissue that forms the outer layer of blood vessels differs from the tissue that forms the inner layer of blood vessels in that the tissue that forms the outer layer of blood vessels -

A- its cells are characterized by cells that are embedded in large amounts of an intercellular substance **B-** is a connective tissue **C-** is an epithelial tissue **D-** both (A and B) are correct

20-Which of the following is **incorrect** regarding the cylinders in the structure of a long bone?

A- contains yellow bone marrow. **B-** consists of lamellae.

C- it is a part of the compact bone.

D- In the center of each cylinder there is a Haversian canal 21-In which of the following crosses, the genotype ratio of homozygous and heterozygous is equal to 1:1: -

A- monohybrid cross (heterozygous × heterozygous) **B-** monohybrid cross (heterozygous × heterozygous)

C- incomplete dominance (heterozygous × heterozygous) **D-** All of them are correct

22-Rods differ from cones in that, rods: - **A**-are stimulated by bright light **B**- contain rhodopsin. C- initiate the production of sharp colors. D- respond to different colors

23-All of the following are bones of the appendicular skeleton, **EXCEPT**: -

C- fibula A- clavicle **B-** sternum

24-The smooth muscle:

A- is found in the female reproductive tract.

B- is arranged in opposing pairs.

C- its muscle fibers are not surrounded by connective tissue. **D-** has both origin and insertion points

25-Which of the following always presenting new antigens?

B- flu viruses **A-** rhinoviruses

D- All of them are correct

26-Natural killer cells differ from neutrophils in that natural killer cells: -

A- are white blood cells.

B- contribute to general defenses. **D-** Ingest pathogens

C- attack pathogen-infected cells with the pathogen.

27-All of the following groups have a hormone that the site of secretion does not belong to them, EXCEPT: -

A- insulin, prostaglandin, glucagon. **B-** oxytocin, epinephrine, antidiuretic hormone **C-** aldosterone, cortisol, glucagon **D-** thyroid stimulating hormone, adrenocorticotropic hormone, follicle-stimulating hormone

28-Which of the following blood vessels contains (transports) dark red blood?

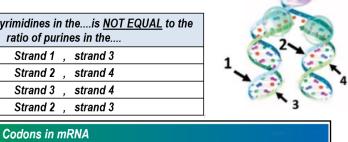
A- both superior and inferior vena cava **B-** Pulmonary veins **C-** Pulmonary artery **D-** both (A and C) are correct

29-Which of the following secretes estrogen?
A- the mature egg B- corpus luteum C- growing umbilical cord D- All of them are correct
 30-In an addict person after removing cocaine from the synapse and dopamine release returns to normal, the postsynaptic neuron: - A- is overstimulated B- is under stimulated C- the number of receptor proteins on the postsynaptic cell decreases. D- both (B and C) are correct
 31-Antibodies bind to pathogens stopping their activity and destroying them: - A- Indirectly by the specific defenses B- by preventing them from entering a cell, thereby blocking its reproduction. C- by creating holes in the membranes of pathogen infected cells D- All of them are correct
32- According to Mendel's experiments on pea plants, which of the following represents cross-pollination?
A- Tt × Tt B- TT × tt C- TT × TT D- All of them are correct
 33-The receptors that have tiny particles of calcium carbonate on top of them, are known as:- A- mechanoreceptors. B- pain receptors. C- chemoreceptors. D- photoreceptors
34- Which part of the cerebrum interprets touch information? A- cerebral cortex B- diencephalon. C- midbrain. D- the part of the cerebrum that lies beneath the surface of the cerebral cortex
35- During the first trimester:
 A- primary germ layers do not form. B- the four embryonic membranes are not formed C- the mother does not feel the movement of the fetus. D- the heart does not start beating
36- All of the following is correct regarding the pivot joint, EXCEPT : -
A- it is a type of a movable joint. B- it allows the body to bend and twist. D- it is found in the vertebral column. B- it allows the body to bend and twist. D- it is found in the axial skeleton
37-In Mendelian genetics, an allele (factor) is considered as a dominant if:
A- able to express itself only in the homozygous state B- able to express itself only in the heterozygous state C- able to mask the effect of the other allele (factor) in the heterozygous state
C- able to mask the effect of the other allele (factor) in the heterozygous state D- blending of two alleles occurs in the heterozygous state
38- Which of the following is correct regarding the secondary immune response when a person is infected
with the same pathogen for the second time?
A- protects the person from infecting with a new pathogen. B- memory cells are produced for the first time.
C- memory cells immediately recognize it and begin to divide rapidly D- both (B and C) are correct 39- The secretory cells and target cells of which of the following hormones are part of the same organ?
A- secretin B- gastrin C- parathyroid D- calcitonin
40 -The two adjacent figures represent the results of the Hershey and Chase experiments,
in which experiment they used ³⁵ S and in which experiment they used ³² P?
A- In the first experiment they used ³⁵ S, in the second experiment they used ³² P
B- in the first experiment they used ³² P, in the second experiment they used ³⁵ S
C- in both experiments they used ³⁵ S
D- in both experiments they used ³² P Experiment 1 Experiment 2
41- In a monohybrid cross, if half of the resulting offspring show the dominant trait, the genotype of the parents: -
A- both are heterozygous. B- one is heterozygous and the other is homozygous dominant
C- one is heterozygous and the other is recessive. D- both are homozygous
42- Which of the following is <u>incorrect</u> regarding the process of protein synthesis in eukaryotes?
A- by using the codon table, the codon GCU specifies the amino acid alanine in the genetic code of all living organisms B- In the transcription, a part of one of the two DNA strands is used to transcribe tRNA
C- The translation can begin even before transcription has finished D- transcription takes place in the nucleus.
43 -In the 28-day period of the ovarian and menstrual cycles, which of the following occurs one after the other
(in sequence)? (1- Secretion of follicle-stimulating hormone, 2- Formation of corpus luteum, 3- Growth and
development of the follicle, 4- Ovulation, 5- The sharp rise in the concentration of luteinizing hormone)
A-2 1 3 5 4 $B-1$ 3 5 4 2
$\begin{array}{ c c c c c c c c c c c c c c c c c c c$

- **44-**Which of the following is correct regarding the structure of a DNA molecule?

 1.the number of sugar molecules is equal to the number of the phosphate group molecules.
- 2. each nucleotide can differ from another nucleotide only in the type of nitrogenous base.
- 3.the nitrogenous base is connected to the phosphate group directly by a covalent bond.
- **A-1**, 2. **B-1**, 3 **C-2**, 3 **D-1**, 2, 3
- 45-Test cross determines the genotype of any individual who expresses the: -
- **A-** dominant phenotype. **B-** recessive phenotype **C-** dominant phenotype and recessive phenotype **D-** intermediate phenotype
- **46-**The promoter differs from the start codon in that the promoter: -
- **A-** is a specific nucleotide sequence of DNA. **B-** DNA polymerase binds to it
- **C-** indicates where translation should begin **D-** both (A and B) are correct
- **47-**At which step of translation does the last tRNA leave the ribosome?
 - **A-** elongation **B-** initiation **C-** termination **D-** disassembly
- **48-** According to the adjacent figure that shows the process of DNA replication, after completing this process, which of the choices in the following table is correct regarding the ratio of pyrimidines and the ratio of purines?

	The ratio of pyrimidines in theis equal to the ratio of purines in the	The ratio of pyrimidines in theis <u>NOT EQUAL</u> to the ratio of purines in the
Α	Strand 2 , strand 4	Strand 1 , strand 3
В	Strand 1 , strand 4	Strand 2 , strand 4
С	Strand 2 , strand 3	Strand 3 , strand 4
D	Strand 1 , strand 3	Strand 2 , strand 3



Third base

Tryptophai

49-According to the adjacent codon table, if this DNA sequence (CTCAAGTGCTTC) complements the strand that serves as a template to make mRNA, which of the following polypeptides is produced?

- **A-** Leucine Tyrosine –Arginine Phenylalanine
- **B-** Valine Aspartic Acid Proline Histidine
- **C-** Leucine Lysine Cysteine Phenylalanine
- **D-** Proline Glutamic Acid Leucine valine

	Α	Isoleucine Isoleucine Methionine (start	Threonine Threonine	Asparagine Lysine Lysine	Arginine Arginine	A G	
9	G	Valine Valine Valine Valine	Alanine Alanine Alanine Alanine	Aspartic acid Aspartic acid Glutamic acid Glutamic acid	Glycine Glycine Glycine Glycine	U C A G	
has sh	ort ster	n and axial	flowers	and the oti	her is unk	nown fo	or
nt and	axial flo	wers: 1 sho	ort stem	plant and	terminal f	lowers)	,
the iii	nknown	nlant·-					

Second base

50-In a dihybrid cross between two pea plants, one has short stem and axial flowers and the other is unknown for both traits, these ratios produced (1 short stem plant and axial flowers: 1 short stem plant and terminal flowers), which of the following represents the phenotype of the unknown plant:-

First base

U

C

A- short stem and terminal flowers

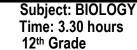
B- tall stem and terminal flowers

C- short stem and axial flowers

D-tall stem and axial flowers

Kurdistan Region Government- Iraq In the Name of Allah Ministry of Education-High Committee of General Examinations General exams for preparatory stage (Scientific)

General exams for preparatory stage (Scientific)
For the academic year (2024-2025) Second Sitting





Note: choose the correct answer: - (2 marks for each right answer)

1-Which of the following secretes estrogen?

A- the mature egg B- corpus luteum C- growing umbilical cord D- All of them are correct

2-Antibodies bind to pathogens stopping their activity and destroying them: -

A- Indirectly by the specific defenses B- by preventing them from entering a cell, thereby blocking its reproduction.

C- by creating holes in the membranes of pathogen infected cells **D-** All of them are correct

3-White blood cells are able to perform their function because:

A- they are capable of secreting blood clotting enzymes. **B-** they are formed in the red bone marrow

C- they can squeeze their way through openings in the walls of blood vessels into the intercellular fluid.

D- their nucleus and organelles disappear

4-Which of the following is correct regarding the vas deference?

A- it loops around the urethra. **B-** each normal male person has two

C- transports semen to the urethra. **D-** all of them are correct

5-Which of the following is correct regarding the secondary immune response when a person is infected with the same pathogen for the second time?

A- protects the person from infecting with a new pathogen. **B-** memory cells are produced for the first time.

C- memory cells immediately recognize it and begin to divide rapidly D- both (B and C) are correct

6-The smooth muscle:

A- is found in the female reproductive tract. **B-** is arranged in opposing pairs.

C- its muscle fibers are not surrounded by connective tissue. **D-** has both origin and insertion points

7-Natural killer cells differ from neutrophils in that natural killer cells: -

A- are white blood cells.

B- contribute to general defenses.

C- attack pathogen-infected cells with the pathogen. **D-** Ingest pathogens

8-Which of the following blood vessels contains (transports) dark red blood?

A- both superior and inferior vena cava B- Pulmonary veins C- Pulmonary artery D- both (A and C) are correct

9-The motor division of the peripheral nervous system controls: - A- skeletal muscle movement

B- regulating smooth muscles **C-** secretion of all of the body's hormones directly **D-** both (A and B) are correct

10-Rods differ from cones in that, rods: - **A-**are stimulated by bright light **B-** contain rhodopsin.

C- initiate the production of sharp colors. D- respond to different colors

11-Which of the following is a sequence of nucleotides in the template strand of a DNA molecule that is transcribed into a codon but then its not translated?

A-TAC **B-** ACT **C-** ATC **D-** both (B and C) are correct

12-Which part of the cerebrum interprets touch information? **A-** cerebral cortex **B-** diencephalon. **C-** midbrain. **D-** the part of the cerebrum that lies beneath the surface of the cerebral cortex

13-Which of the following is correct regarding the diastole phase?

A- The direction of blood movement is from the atria to the ventricles.

B- It is represented by the P wave in the electrocardiograph (ECG).

C- It takes longer than the atrial contraction phase. **D-** Blood flows to fill the ventricles

14-During the first trimester:

A- primary germ layers do not form. **B-** the four embryonic membranes are not formed

C- the mother does not feel the movement of the fetus. **D-** the heart does not start beating

15-The receptors that have tiny particles of calcium carbonate on top of them, are known as:- **A-** mechanoreceptors. **B-** pain receptors. **C-** chemoreceptors. **D-** photoreceptors

A- mechanoreceptors. **B-** pain receptors. **C-** chemoreceptors. **D-** photoreceptors **16-**Which of the following is **incorrect** regarding the cylinders in the structure of a long bone?

A- contains yellow bone marrow. **B-** consists of lamellae.

D- In the center of each cylinder there is a Haversian canal

17-Which of the following secretes testosterone?

C- it is a part of the compact bone.

A- testis B- seminal vesicles C- prostate gland D- All of them are incorrect

18-The secretory cells and target cells of which of the following hormones are part of the same organ? **A-** secretin **B-** gastrin **C-** parathyroid **D-** calcitonin

19-All of the following secrete a fluid that reduces (decreases) friction, EXCEPT: -

A- pleura **B-** diaphragm **C-** the tissue that lines the surfaces of the knee joint **D-** pericardium

20-vesicles fuse with the presynaptic membrane when?

A- neurotransmitters are broken down by enzymes.

D- blending of two alleles occurs in the heterozygous state

B- an action potential reaches the axon terminal of the presynaptic neuron

C- neurotran'smitters are reabsorbed by a postsynaptic cell. D- the sodium-potassium pump is activated

21-In Mendelian genetics, an allele (factor) is considered as a dominant if:

A- able to express itself only in the homozygous state **B-** able to express itself only in the heterozygous state

C- able to mask the effect of the other allele (factor) in the heterozygous state

22-According to Mendel's experiments on pea plants, which of the following represents cross-pollination?

A- $Tt \times Tt$ **B-** $TT \times tt$ **C-** $TT \times TT$ **D-** All of them are correct

23-All of the following occur in the fallopian tube, **EXCEPT**: - **A-** formation of morula **B-** formation of zygote **C-** meiosis *II* of the egg **D-** formation of first polar body

24-All of the following groups have a hormone that the site of secretion does not belong to them, **EXCEPT**: -

A- insulin, prostaglandin, glucagon. **B-** oxytocin, epinephrine, antidiuretic hormone **C-** aldosterone, cortisol, glucagon **D-** thyroid stimulating hormone, adrenocorticotropic hormone, follicle-stimulating hormone

25-In which principle of Koch's postulates principles, the pathogen is grown in the laboratory? **A-1** and 3. **B-2** and 4 **C-1** and 2. **D-3** and 4.

26-The adjacent table shows the results of mixing several blood samples, which result in the following table is

Sample 1 Sample 2 The result (the slide shape)

A A A A+

C O AB+

correct?

		Sample 2 (Recipient)	The result (the slide shape)
В	AB ⁻	O ⁺	
D	B-	AB ⁻	

27-In which of the following crosses, the genotype ratio of homozygous and heterozygous is equal to 1:1: -

A- monohybrid cross (heterozygous × heterozygous) **B-** monohybrid cross (heterozygous × heterozygous) **C-** incomplete dominance (heterozygous × heterozygous) **D-** All of them are correct

28-The tissue that forms the outer layer of blood vessels differs from the tissue that forms the inner layer of blood vessels in that the tissue that forms the outer layer of blood vessels -

A- its cells are characterized by cells that are embedded in large amounts of an intercellular substance **B-** is a connective tissue **C-** is an epithelial tissue **D-** both (A and B) are correct

29-All of the following is correct regarding the pivot joint, EXCEPT: -

A- it is a type of a movable joint. **B-** it allows the body to bend and twist.

C- it is found in the vertebral column. **D-** it is found in the axial skeleton

30-.....is a molecule that initiates changes inside a cell in response to the binding of a specific substance to a receptor on the outside (surface) of a cell?

A- first messenger. B- receptor protein. C- second messenger. D- hormone-receptor complex

31-Which of the following always presenting new antigens?

A- rhinoviruses B- flu viruses C-HIV D- All of them are correct

32-According on the adjacent figure that shows the endometrium, maternal portion of placenta, and the fetal portion of placenta, choose the correct answer from the following:-

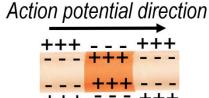
A- numbers 1 and 2 point to maternal veins,

B- numbers 1 and 2 point to maternal arteries,

C- number 1 points to an umbilical vein, and number 2 points a maternal vein

D- number 1 points to a maternal vein and the number 2 points to an umbilical artery

33-The adjacent figure shows a part of the neuron axon, which of the following is correct regarding the movement of ions in their specific places on the figure across the neuron axon membrane? The movement of ions in their specific places on the figure across the neuron axon membrane Α Sodium and potassium ions exit from the nerve cell Sodium and potassium ions enter the nerve cell Sodium ions exit from the nerve cell and potassium ions enter the nerve cell Sodium ions enter the nerve cell and potassium ions exit from the nerve cell



34-In which of the following states the adrenaline is released? **A-**low blood glucose concentration **C-**after the threat period has passed. **D-** both (A and B) are correct **B-**when a person is stressed

35-Which of the following defenses targets a specific type of pathogen?

A-mucous membranes **B-**inflammatory response **C-**specific defenses **D**-temperature response

36-Skeletal muscles:

A- are not attached to the periosteum. **B-** are directly attached to the periosteum.

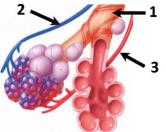
C- are attached to the periosteum by a tendon. **D-** both (B and C) are correct

37-All of the following are bones of the appendicular skeleton, **EXCEPT**: -

A- clavicle **B-** sternum **C-** fibula **D-** scapula

38-Based on the adjacent figure, choose the correct answer from the following table: -

	The blood in the blood vessel that is labeled by number 2: -	The blood in the blood vessel that is labeled by number 3: -	During exhalation the air in the structure that is labeled by number 1 passes into the: -
Α	comes from the right ventricle	returns to the left atrium	alveoli
В	returns to the left atrium	comes from the right ventricle	bronchus
С	comes from the right ventricle	returns to the left atrium	bronchus
D	returns to the right ventricle	comes from the left atrium	alveoli



39-In an addict person after removing cocaine from the synapse and dopamine release returns to normal, the postsynaptic neuron: -**A-** is overstimulated **B-** is under stimulated

C- the number of receptor proteins on the postsynaptic cell decreases. **D-** both (B and C) are correct

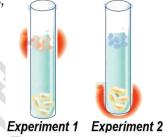
40-The two adjacent figures represent the results of the Hershey and Chase experiments, in which experiment they used ³⁵S and in which experiment they used ³²P?

A- In the first experiment they used ³⁵S, in the second experiment they used ³²P

B- in the first experiment they used ³²P, in the second experiment they used ³⁵S

C- in both experiments they used ³⁵S

D- in both experiments they used ³²P



41-The promoter differs from the start codon in that the promoter: -

A- is a specific nucleotide sequence of DNA.

B- DNA polymerase binds to it

C- indicates where translation should begin

D- both (A and B) are correct

42-In the 28-day period of the ovarian and menstrual cycles, which of the following occurs one after the other (in sequence)? (1- Secretion of follicle-stimulating hormone, 2- Formation of corpus luteum, 3- Growth and development of the follicle, 4- Ovulation, 5- The sharp rise in the concentration of luteinizing hormone)

43-Test cross determines the genotype of any individual who expresses the: -

A- dominant phenotype.

B- recessive phenotype

C- dominant phenotype and recessive phenotype

D- intermediate phenotype

44-Which of the following is **incorrect** regarding the process of protein synthesis in eukaryotes?

A-by using the codon table, the codon GCU specifies the amino acid alanine in the genetic code of all living organisms

B- In the transcription, a part of one of the two DNA strands is used to transcribe tRNA

C- The translation can begin even before transcription has finished **D-** transcription takes place in the nucleus.

45-According to the adjacent codon table, if this DNA Codons in sequence (CTCAAGTGCTTC) complements the strand that serves as a template to make mRNA, which of the following polypeptides is produced?

A- Leucine – Tyrosine – Arginine – Phenylalanine

B- Valine – Aspartic Acid – Proline – Histidine

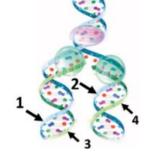
C- Leucine – Lysine – Cysteine – Phenylalanine

D- Proline – Glutamic Acid – Leucine – valine

Codons in mrna					
First base		Second base			Third base
	U	С	A	G	
U	Phenylalanine Phenylalanine Leucine Leucine	Serine Serine Serine Serine	Tyrosine Tyrosine Stop Stop	Cysteine Cysteine Stop Tryptophan	U C A G
С	Leucine Leucine Leucine Leucine	Proline Proline Proline Proline	Histidine Histidine Glutamine Glutamine	Arginine Arginine Arginine Arginine	U C A G
Α	Isoleucine Isoleucine Isoleucine Methionine (start)	Threonine Threonine Threonine Threonine	Asparagine Asparagine Lysine Lysine	Serine Serine Arginine Arginine	UCAG
G	Valine Valine Valine Valine	Alanine Alanine Alanine Alanine	Aspartic acid Aspartic acid Glutamic acid Glutamic acid	Glycine Glycine Glycine Glycine	U C A G

46- According to the adjacent figure that shows the process of DNA replication, after completing this process, which of the choices in the following table is correct regarding the ratio of pyrimidines and the ratio of purines?

	The ratio of pyrimidines in theis equal to the ratio of purines in the	The ratio of pyrimidines in theis <u>NOT EQUAL</u> to the ratio of purines in the		
Δ	Strand 2 , strand 4	Strand 1 , strand 3		
В	Strand 1 , strand 4	Strand 2 , strand 4		
C		Strand 3 , strand 4		
C	Strand 1 , strand 3	Strand 2 , strand 3		



47-In a dihybrid cross between two pea plants, one has short stem and axial flowers and the other is unknown for both traits, these ratios produced (1 short stem plant and axial flowers: 1 short stem plant and terminal flowers), which of the following represents the phenotype of the unknown plant:-

A- short stem and terminal flowers

B- tall stem and terminal flowers

C- short stem and axial flowers

D-tall stem and axial flowers

48-In a monohybrid cross, if half of the resulting offspring show the dominant trait, the genotype of the parents: -

A- both are heterozygous. **B-** one is heterozygous and the other is homozygous dominant

C- one is heterozygous and the other is recessive. **D-** both are homozygous

49-At which step of translation does the last tRNA leave the ribosome?

A- elongation

B- initiation

C- termination

D- disassembly

50-Which of the following is correct regarding the structure of a DNA molecule?

1.the number of sugar molecules is equal to the number of the phosphate group molecules.

2. each nucleotide can differ from another nucleotide only in the type of nitrogenous base. 3.the nitrogenous base is connected to the phosphate group directly by a covalent bond.

A-1. 2.

B- 1. 3

C- 2. 3

D- 1. 2. 3

Kurdistan Region Government- Irag In the Name of Allah Ministry of Education-High Committee of General Examinations General exams for preparatory stage (Scientific)

For the academic year (2024-2025) Second Sitting

Subject: BIOLOGY Time: 3.30 hours 12th Grade



Note: choose the correct answer: - (2 marks for each right answer)

1-The tissue that forms the outer layer of blood vessels differs from the tissue that forms the inner layer of blood vessels in that the tissue that forms the outer layer of blood vessels -

A- its cells are characterized by cells that are embedded in large amounts of an intercellular substance

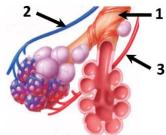
B- is a connective tissue

C- is an epithelial tissue

D- both (A and B) are correct

2-Based on the adjacent figure, choose the correct answer from the following table: -

	The blood in the blood vessel that is labeled by number 2: -	The blood in the blood vessel that is labeled by number 3: -	During exhalation the air in the structure that is labeled by number 1 passes into the: -
Α	comes from the right ventricle	returns to the left atrium	alveoli
В	returns to the left atrium	comes from the right ventricle	bronchus
С	comes from the right ventricle	returns to the left atrium	bronchus
D	returns to the right ventricle	comes from the left atrium	alveoli



3-The adjacent table shows the results of mixing several blood samples, which result in the following table is

correc	t?

	Sample 1 (Donor)	Sample 2 (Recipient)	The result (the slide shape)
Α	A -	A ⁺	
С	0-	AB ⁺	

	Sample 1 (Donor)	Sample 2 (Recipient)	The result (the slide shape)
В	AB-	O+	
D	B⁻	AB⁻	

4-Natural killer cells differ from neutrophils in that natural killer cells: -

A- are white blood cells.

B- contribute to general defenses.

C- attack pathogen-infected cells with the pathogen.

D- Ingest pathogens

5-Which of the following is correct regarding the secondary immune response when a person is infected with the same pathogen for the second time?

A- protects the person from infecting with a new pathogen. **B-** memory cells are produced for the first time.

C- memory cells immediately recognize it and begin to divide rapidly **D-** both (B and C) are correct **6-**In which of the following states the adrenaline is released?

B-when a person is stressed

C-after the threat period has passed.

A-low blood glucose concentration **D-** both (A and B) are correct

7-During the first trimester:

A- primary germ layers do not form. **B-** the four embryonic membranes are not formed

C- the mother does not feel the movement of the fetus.

D- the heart does not start beating

8-Which of the following secretes estrogen?

B- corpus luteum **A-** the mature egg

C- growing umbilical cord

D- All of them are correct

9-Which of the following secretes testosterone?

A- testis **B-** seminal vesicles

C- prostate gland

D- All of them are incorrect

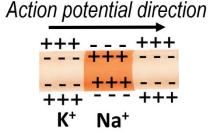
10-The receptors that have tiny particles of calcium carbonate on top of them, are known as:-

A- mechanoreceptors. **B-** pain receptors. **C-** chemoreceptors.

D- photoreceptors

11-The adjacent figure shows a part of the neuron axon, which of the following is correct regarding the movement of ions in their specific places on the figure across the neuron axon membrane?

	The movement of ions in their specific places on the figure across the neuron axon membrane
Α	Sodium and potassium ions exit from the nerve cell
В	Sodium and potassium ions enter the nerve cell
С	Sodium ions exit from the nerve cell and potassium ions enter the nerve cell
D	Sodium ions enter the nerve cell and potassium ions exit from the nerve cell



12-The secretory cells and target cells of which of the following hormones are part of the same organ?

A- secretin

13-Skeletal muscles:

A- are not attached to the periosteum.

B- are directly attached to the periosteum.

C- are attached to the periosteum by a tendon.

D- both (B and C) are correct

14-Antibodies bind to pathogens stopping their activity and destroying them: -

A- Indirectly by the specific defenses **B-** by preventing them from entering a cell, thereby blocking its reproduction.

C- parathyroid

C- by creating holes in the membranes of pathogen infected cells **D-** All of them are correct

15-Which of the following always presenting new antigens?

B- gastrin

A- rhinoviruses **B-** flu viruses

D- All of them are correct

D- calcitonin

16-vesicles fuse with the presynaptic membrane when?

A- neurotransmitters are broken down by enzymes.

B- an action potential reaches the axon terminal of the presynaptic neuron

C- neurotran'smitters are reabsorbed by a postsynaptic cell. **D-** the sodium-potassium pump is activated

17-Which of the following is **incorrect** regarding the cylinders in the structure of a long bone?

A- contains yellow bone marrow.

B- consists of lamellae.

C- it is a part of the compact bone.

D- In the center of each cylinder there is a Haversian canal

18-All of the following is correct regarding the pivot joint, EXCEPT: -

A- it is a type of a movable joint. **C-** it is found in the vertebral column. **B-** it allows the body to bend and twist. **D-** it is found in the axial skeleton

19-In an addict person after removing cocaine from the synapse and dopamine release returns to normal, the postsynaptic neuron: -A- is overstimulated

B- is under stimulated

C- the number of receptor proteins on the postsynaptic cell decreases.

D- both (B and C) are correct

D- pericardium

20-Which of the following blood vessels contains (transports) dark red blood?

A- both superior and inferior vena cava **B-** Pulmonary veins **C-** Pulmonary artery **D-** both (A and C) are correct A- skeletal muscle movement

21-The motor division of the peripheral nervous system controls: -

B- regulating smooth muscles **C-** secretion of all of the body's hormones directly **D-** both (A and B) are correct

22-All of the following secrete a fluid that reduces (decreases) friction, **EXCEPT**: -

B- diaphragm **C-** the tissue that lines the surfaces of the knee joint

23-In which principle of Koch's postulates principles, the pathogen is grown in the laboratory? **A-**1 and 3. **B-**2 and 4 **C-1** and 2. **D-**3 and 4.

24-According on the adjacent figure that shows the endometrium, maternal portion of placenta,

and the fetal portion of placenta, choose the correct answer from the following:-

A- numbers 1 and 2 point to maternal veins,

B- numbers 1 and 2 point to maternal arteries.

C- number 1 points to an umbilical vein, and number 2 points a maternal vein

D- number 1 points to a maternal vein and the number 2 points to an umbilical artery

25-Which of the following is correct regarding the vas deference?

A- it loops around the urethra.

B- each normal male person has two

C- transports semen to the urethra.

D- all of them are correct

26-In which of the following crosses, the genotype ratio of homozygous and heterozygous is equal to 1:1: -

A- monohybrid cross (heterozygous × heterozygous) **B-** monohybrid cross (heterozygous × heterozygous) C- incomplete dominance (heterozygous × heterozygous) D- All of them are correct

A- able to express itself only in the homozygous state B- able to express itself only in the heterozygous state C- able to mask the effect of the other allele (factor) in the heterozygous state D- blending of two alleles occurs in the heterozygous state D- blending of two alleles occurs in the heterozygous state D- blending of two alleles occurs in the heterozygous state D- blending of two alleles occurs in the heterozygous state D- blending of two alleles occurs in the heterozygous state C- one is heterozygous and the other is homozygous dominant C- one is heterozygous and the other is homozygous dominant C- one is heterozygous and the other is homozygous dominant C- one is heterozygous and the other is homozygous dominant C- one is heterozygous and the other is homozygous dominant C- one is heterozygous and the other is homozygous dominant C- one is heterozygous and the other is homozygous dominant C- one is heterozygous and the other is homozygous dominant C- one is heterozygous and the other is homozygous dominant C- one is heterozygous and the other is homozygous dominant C- one is heterozygous and the other is homozygous dominant C- one is heterozygous and the other is homozygous dominant C- one is heterozygous and the other is homozygous dominant C- one is heterozygous and the other is homozygous dominant C- one is heterozygous. B- one is heterozygous and the other is homozygous dominant C- one is heterozygous. B- one is heterozygous and the other is homozygous dominant C- one is heterozygous. B- one is heterozygous and the other is homozygous dominant C- one is heterozygous. B- one is heterozygous and the other is homozygous dominant C- one is heterozygous. B- one is heterozygous and the other is homozygous dominant C- one is heterozygous. B- one is heterozygous. B- one is heterozygous. B- one is heterozygous dominant C- one is heterozygous dominant C- one is heterozygous. B- one is heterozygous dominant C- o	27-Which of the following defenses targets a specific type of pathogen? A-mucous membranes B-inflammatory response C-specific defenses D-temperature response 28-All of the following occur in the fallopian tube, EXCEPT: - A- formation of morula B- formation of zygote C- meiosis II of the egg D- formation of first polar body 29-All of the following are bones of the appendicular skeleton, EXCEPT: - A- clavicle B- sternum C- fibula D- scapula 30-White blood cells are able to perform their function because: A- they are capable of secreting blood clotting enzymes. B- they are formed in the red bone marrow C- they can squeeze their way through openings in the walls of blood vessels into the intercellular fluid. D- their nucleus and organelles disappear 31-Rods differ from cones in that, rods: - A-are stimulated by bright light B- contain rhodopsin. C- initiate the production of sharp colors. D- respond to different colors 32-Which of the following is a sequence of nucleotides in the template strand of a DNA molecule that is transcribed into a codon but then its not translated? A-TAC B- ACT C-ATC D- both (B and C) are correct 33-According to Mendel's experiments on pea plants, which of the following represents cross-pollination? A-TI × TI B- TI × tI C- TI × TI D- All of them are correct 34-Which of the following is correct regarding the diastole phase? A- The direction of blood movement is from the atria to the ventricles. B- It is represented by the P-wave in the electrocardiograph (ECG). C- It takes longer than the atrial contraction phase. D- Blood flows to fill the ventricles 35-All of the following groups have a hormone that the site of secretion does not belong to them, EXCEPT: - A- insulin, prostaglandin, glucagon. B- oxytocin, epinephrine, antidiuretic hormone C- aldosterone, cortisol, glucagon D- thyroid stimulating hormone, adrenocorticotropic hormone, follicle-stimulating hormone 36-The smooth muscle: A- is found in the female reproductive tract. B- is arranged in opposing pairs. C-	43-In the 28-day period of the ovarian and menstrual cycles, which of the following occurs one after the other (in sequence)? (1- Secretion of follicle-stimulating hormone, 2- Formation of corpus luteum, 3- Growth and development of the follicle, 4- Ovulation, 5- The sharp rise in the concentration of luteinizing hormone) A-2
40-The two adjacent figures represent the results of the Hershey and Chase experiments, in which experiment they used ³⁵ S and in which experiment they used ³² P? A- In the first experiment they used ³⁵ S, in the second experiment they used ³² P. B- in the first experiment they used ³⁵ S. C- in both experiments they used ³⁵ S. D- in both experiments they used ³² P. A- elongation B- initiation C- termination D- disassembly 49-Which of the following is incorrect regarding the process of protein synthesis in eukaryotes? A-by using the codon table, the codon GCU specifies the amino acid alanine in the genetic code of all living the process of protein synthesis in eukaryotes? A-by using the codon table, the codon GCU specifies the amino acid alanine in the genetic code of all living the process of protein synthesis in eukaryotes? A-by using the codon table, the codon GCU specifies the amino acid alanine in the genetic code of all living the process of protein synthesis in eukaryotes? A-by using the codon table, the codon GCU specifies the amino acid alanine in the genetic code of all living the process of protein synthesis in eukaryotes? A-by using the codon table, the codon GCU specifies the amino acid alanine in the genetic code of all living the process of protein synthesis in eukaryotes? A-by using the codon table, the codon GCU specifies the amino acid alanine in the genetic code of all living the process of protein synthesis in eukaryotes? A-by using the codon table, the codon GCU specifies the amino acid alanine in the genetic code of all living the process of protein synthesis in eukaryotes? A-by using the codon table, the codon GCU specifies the amino acid alanine in the genetic code of all living the process of protein synthesis and the specific to possible the normal support of one of the two DNA strands is used to transcribe the normal support of one of the following is correct regarding the process of protein synthesis in eukaryotes? A-by using the codon table, the codon table, the	 A- able to express itself only in the homozygous state B- able to express itself only in the heterozygous state C- able to mask the effect of the other allele (factor) in the heterozygous state 	
which of the following represents the phenotype of the unknown plant:- A- short stem and terminal flowers B- tall stem and terminal flowers C- short stem and axial flowers D-tall stem and axial flowers	40-The two adjacent figures represent the results of the Hershey and Chase experiments, in which experiment they used ³⁵ S and in which experiment they used ³² P? A- In the first experiment they used ³⁵ S, in the second experiment they used ³⁵ S C- in both experiments they used ³⁵ S D- in both experiments they used ³² P Experiment 1 Experiment 2 41-At which step of translation does the last tRNA leave the ribosome? A- elongation B- initiation C- termination D- disassembly 42-In a dihybrid cross between two pea plants, one has short stem and axial flowers and the other is unknown for both traits, these ratios produced (1 short stem plant and axial flowers: 1 short stem plant and terminal flowers), which of the following represents the phenotype of the unknown plant:- A- short stem and terminal flowers B- tall stem and terminal flowers	 49-Which of the following is incorrect regarding the process of protein synthesis in eukaryotes? A-by using the codon table, the codon GCU specifies the amino acid alanine in the genetic code of all living organism. B- In the transcription, a part of one of the two DNA strands is used to transcribe tRNA C- The translation can begin even before transcription has finished D- transcription takes place in the nucleus. 50-Which of the following is correct regarding the structure of a DNA molecule? 1.the number of sugar molecules is equal to the number of the phosphate group molecules. 2. each nucleotide can differ from another nucleotide only in the type of nitrogenous base. 3.the nitrogenous base is connected to the phosphate group directly by a covalent bond.

Kurdistan Region Government- Iraq

In the Name of Allah Ministry of Education-High Committee of General Examinations General exams for preparatory stage (Scientific)

Subject: BIOLOGY Time: 3.30 hours 12th Grade



Note: choose the correct answer: - (2 marks for each right answer)

1-During the first trimester:

A- primary germ layers do not form. **B-** the four embryonic membranes are not formed

C- the mother does not feel the movement of the fetus.

For the academic year (2024-2025) Second Sitting

D- the heart does not start beating

2-Which of the following always presenting new antigens?

A- rhinoviruses

B- flu viruses

D- All of them are correct

3-According to Mendel's experiments on pea plants, which of the following represents cross-pollination?

 $A-Tt \times Tt$

B- TT × tt

C-TT×TT

D- All of them are correct

4-The motor division of the peripheral nervous system controls: -**A-** skeletal muscle movement **B-** regulating smooth muscles **C-** secretion of all of the body's hormones directly **D-** both (A and B) are correct

5-Natural killer cells differ from neutrophils in that natural killer cells: -

A- are white blood cells.

C- attack pathogen-infected cells with the pathogen.

B- contribute to general defenses.

D- Ingest pathogens

6-The adjacent table shows the results of mixing several blood samples, which result in the following table is

correct?

		Sample 2 (Recipient)	The result (the slide shape)
Α	A -	A ⁺	
С	0-	AB+	

	Sample 1 (Donor)	Sample 2 (Recipient)	The result (the slide shape)
В	AB ⁻	O ⁺	
D	B ⁻	AB ⁻	

7-vesicles fuse with the presynaptic membrane when?

A- neurotransmitters are broken down by enzymes.

B- an action potential reaches the axon terminal of the presynaptic neuron

C- neurotransmitters are reabsorbed by a postsynaptic cell. **D-** the sodium-potassium pump is activated

8-Skeletal muscles:

A- are not attached to the periosteum.

B- are directly attached to the periosteum.

D- both (B and C) are correct **C-** are attached to the periosteum by a tendon. **9-**All of the following secrete a fluid that reduces(decreases) friction, **EXCEPT**: -

A- pleura **B-** diaphragm **C-** the tissue that lines the surfaces of the knee joint

D- pericardium

10-According on the adjacent figure that shows the endometrium, maternal portion of placenta, \blacksquare and the fetal portion of placenta, choose the correct answer from the following:-

A- numbers 1 and 2 point to maternal veins,

B- numbers 1 and 2 point to maternal arteries.

C- number 1 points to an umbilical vein, and number 2 points a maternal vein

D- number 1 points to a maternal vein and the number 2 points to an umbilical artery

11-The smooth muscle:

A- is found in the female reproductive tract.

B- is arranged in opposing pairs.

C- its muscle fibers are not surrounded by connective tissue. **D-** has both origin and insertion points

12-In an addict person after removing cocaine from the synapse and dopamine release returns to normal, the postsynaptic neuron: -A- is overstimulated

B- is under stimulated

C- the number of receptor proteins on the postsynaptic cell decreases. **D-** both (B and C) are correct

			axon, which of the following gure across the neuron axon			
	The movement of ior	ns in their specific place neuron axon membra	s on the figure across the ne	Action potential direction		
Α	Sodium and	d potassium ions exit fror	m the nerve cell	+++ +++ +++		
В	Sodium ai	nd potassium ions enter t	the nerve cell	+++		
С	Sodium ions exit from t	he nerve cell and potassiu	ım ions enter the nerve cell	+++ +++		
D	Sodium ions enter the n	erve cell and potassium i	ons exit from the nerve cell	K ⁺ Na ⁺		
A- 15- A-	.4- All of the following occur in the fallopian tube, <u>EXCEPT</u> : - .A- formation of morula .B- formation of zygote .C- meiosis <i>II</i> of the egg .D- formation of first polar body .5- In which principle of Koch's postulates principles, the pathogen is grown in the laboratory? .6- Based on the adjacent figure, choose the correct answer from the following table: -					
	The blood in the blood vessel that is labeled by number 2: -	The blood in the blood vessel that is labeled by number 3: -	During exhalation the air in the structure the is labeled by number 1 passes into the: -			
Α	comes from the right ventricle	returns to the left atrium	alveoli			
В	returns to the left atrium	comes from the right ventricle	bronchus	3		
С	comes from the right ventricle	returns to the left atrium	hronchus			

	The blood in the blood vessel that is labeled by number 2: -	The blood in the blood vessel that is labeled by number 3: -	During exhalation the air in the structure that is labeled by number 1 passes into the: -	
4	comes from the right ventricle	returns to the left atrium	alveoli	
В	returns to the left atrium	comes from the right ventricle	bronchus	13
С	comes from the right ventricle	returns to the left atrium	bronchus	
D	returns to the right ventricle	comes from the left atrium	alveoli	CID

17-.....is a molecule that initiates changes inside a cell in response to the binding of a specific substance to a receptor on the outside (surface) of a cell?

C- second messenger. **D-** hormone-receptor complex **A-** first messenger. **B-** receptor protein.

18-In which of the following crosses, the genotype ratio of homozygous and heterozygous is equal to 1:1: -A- monohybrid cross (heterozygous × heterozygous) B- monohybrid cross (heterozygous × heterozygous)

C- incomplete dominance (heterozygous × heterozygous) **D-** All of them are correct **19-**Which of the following defenses targets a specific type of pathogen?

A-mucous membranes B-inflammatory response C-specific defenses D-temperature response

20-Which part of the cerebrum interprets touch information? **A-** cerebral cortex **B-** diencephalon.

C- midbrain. **D-** the part of the cerebrum that lies beneath the surface of the cerebral cortex

21-All of the following are bones of the appendicular skeleton, **EXCEPT**: -

C- fibula A- clavicle **B-** sternum **D-** scapula

22-The secretory cells and target cells of which of the following hormones are part of the same organ? **D-** calcitonin

A- secretin **B-** gastrin **C-** parathyroid 23-Antibodies bind to pathogens stopping their activity and destroying them: -

A- Indirectly by the specific defenses **B-** by preventing them from entering a cell, thereby blocking its reproduction.

C- by creating holes in the membranes of pathogen infected cells **D-** All of them are correct

24-Which of the following secretes testosterone?

B- seminal vesicles **C-** prostate gland **D-** All of them are incorrect

25-Which of the following is a sequence of nucleotides in the template strand of a DNA molecule that is transcribed into a codon but then its not translated?

A-TAC **B-** ACT C- ATC **D-** both (B and C) are correct

26-Rods differ from cones in that, rods: - **A**-are stimulated by bright light **B**- contain rhodopsin. **C-** initiate the production of sharp colors. **D-** respond to different colors

27-White blood cells are able to perform their function because:

A- they are capable of secreting blood clotting enzymes. **B-** they are formed in the red bone marrow

C- they can squeeze their way through openings in the walls of blood vessels into the intercellular fluid.

D- their nucleus and organelles disappear

28-In which of the following states the adrenaline is released? **A-**low blood alucose concentration **C-**after the threat period has passed. **B-**when a person is stressed **D-** both (A and B) are correct

29 -All of the following groups have a hormone that the site of secretion <u>does not</u> belong to them, <u>EXCEPT</u> : - A- insulin, prostaglandin, glucagon. B- oxytocin, epinephrine, antidiuretic hormone C- aldosterone, cortisol, glucagon D- thyroid stimulating hormone, adrenocorticotropic hormone, follicle-stimulating hormone
30-Which of the following secretes estrogen?
A- the mature egg B- corpus luteum C- growing umbilical cord D- All of them are correct
31-The receptors that have tiny particles of calcium carbonate on top of them, are known as:-
A- mechanoreceptors. B- pain receptors. C- chemoreceptors. D- photoreceptors
32-Which of the following blood vessels contains (transports) dark red blood?
A- both superior and inferior vena cava B- Pulmonary veins C- Pulmonary artery D- both (A and C) are correct
33-Which of the following is correct regarding the secondary immune response when a person is infected
with the same pathogen for the second time?
A- protects the person from infecting with a new pathogen. B- memory cells are produced for the first time. C- memory cells immediately recognize it and begin to divide rapidly D- both (B and C) are correct
34- Which of the following is correct regarding the diastole phase?
A- The direction of blood movement is from the atria to the ventricles.
B- It is represented by the P wave in the electrocardiograph (ECG).
C- It takes longer than the atrial contraction phase. D- Blood flows to fill the ventricles
35- Which of the following is incorrect regarding the cylinders in the structure of a long bone?
A- contains yellow bone marrow. B- consists of lamellae.
 A- contains yellow bone marrow. C- it is a part of the compact bone. B- consists of lamellae. D- In the center of each cylinder there is a Haversian canal
36- Which of the following is correct regarding the vas deference?
A- it loops around the urethra. B- each normal male person has two
A- it loops around the urethra. B- each normal male person has two D- all of them are correct
37- The tissue that forms the outer layer of blood vessels differs from the tissue that forms the inner layer of
blood vessels in that the tissue that forms the outer layer of blood vessels -
A- its cells are characterized by cells that are embedded in large amounts of an intercellular substance
B- is a connective tissue C- is an epithelial tissue D- both (A and B) are correct
38 -All of the following is correct regarding the pivot joint, EXCEPT : -
A- it is a type of a movable joint. B- it allows the body to bend and twist. D- it is found in the vertebral column. B- it allows the body to bend and twist.
 39-In Mendelian genetics, an allele (factor) is considered as a dominant if: A- able to express itself only in the homozygous state B- able to express itself only in the heterozygous state
C- able to express itself only in the hornozygous state C- able to mask the effect of the other allele (factor) in the heterozygous state
D- blending of two alleles occurs in the heterozygous state
40 -The two adjacent figures represent the results of the Hershey and Chase experiments,
in which experiment they used ³⁵ S and in which experiment they used ³² P?
A- In the first experiment they used ³⁵ S, in the second experiment they used ³² P
B- in the first experiment they used ³² P, in the second experiment they used ³⁵ S
C- in both experiments they used ³⁵ S
D- in both experiments they used ³² P Experiment 1 Experiment 2
41- Which of the following is incorrect regarding the process of protein synthesis in eukaryotes?
A- by using the codon table, the codon GCU specifies the amino acid alanine in the genetic code of all living organisms
B- In the transcription, a part of one of the two DNA strands is used to transcribe tRNA
C- The translation can begin even before transcription has finished D- transcription takes place in the nucleus.
42- Test cross determines the genotype of any individual who expresses the: -
A- dominant phenotype. B- recessive phenotype
C- dominant phenotype and recessive phenotype D- intermediate phenotype
43-In a monohybrid cross, if half of the resulting offspring show the dominant trait, the genotype of the parents: -
A- both are heterozygous. B- one is heterozygous and the other is homozygous dominant
C- one is heterozygous and the other is recessive D- both are homozygous

- **44-**In the 28-day period of the ovarian and menstrual cycles, which of the following occurs one after the other (in sequence)? (1- Secretion of follicle-stimulating hormone, 2- Formation of corpus luteum, 3- Growth and development of the follicle, 4- Ovulation, 5- The sharp rise in the concentration of luteinizing hormone)
- A-2 1 3 5 4 C-3 1 2 5 4
- **45**-According to the adjacent codon table, if this DNA sequence (CTCAAGTGCTTC) complements the strand that serves as a template to make mRNA, which of the following polypeptides is produced?
- A- Leucine Tyrosine Arginine Phenylalanine
- **B-** Valine Aspartic Acid Proline Histidine
- **C-** Leucine Lysine Cysteine Phenylalanine
- **D-** Proline Glutamic Acid Leucine valine

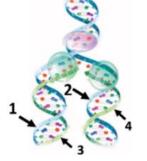
ı	Codons in mRNA					
ı	First base		Secon	d base		Third base
1		U	С	Α	G	
	U	Phenylalanine Phenylalanine Leucine Leucine	Serine Serine Serine Serine	Tyrosine Tyrosine Stop Stop	Cysteine Cysteine Stop Tryptophan	U C A G
	С	Leucine Leucine Leucine Leucine	Proline Proline Proline Proline	Histidine Histidine Glutamine Glutamine	Arginine Arginine Arginine Arginine	U C A G
	Α	Isoleucine Isoleucine Isoleucine Methionine (start)	Threonine Threonine Threonine Threonine	Asparagine Asparagine Lysine Lysine	Serine Serine Arginine Arginine	U C A G
	G	Valine Valine Valine Valine	Alanine Alanine Alanine Alanine	Aspartic acid Aspartic acid Glutamic acid Glutamic acid	Glycine Glycine Glycine Glycine	U C A G

- **46-**In a dihybrid cross between two pea plants, one has short stem and axial flowers and the other is unknown for both traits, these ratios produced (1 short stem plant and axial flowers: 1 short stem plant and terminal flowers), which of the following represents the phenotype of the unknown plant:-
 - **A-** short stem and terminal flowers
- **B-** tall stem and terminal flowers

C- short stem and axial flowers

- **D-**tall stem and axial flowers
- **47-** According to the adjacent figure that shows the process of DNA replication, after completing this process, which of the choices in the following table is correct regarding the ratio of pyrimidines and the ratio of purines?

100 - 0				
The ratio of pyrimidines in theis equal to the ratio of purines in the		The ratio of pyrimidines in theis <u>NOT EQUAL</u> to the ratio of purines in the		
Α	Strand 2 , strand 4	Strand 1 , strand 3		
В	Strand 1 ,strand 4	Strand 2 , strand 4		
С	Strand 2 , strand 3	Strand 3 , strand 4		
D	Strand 1 , strand 3	Strand 2 , strand 3		



- 48-The promoter differs from the start codon in that the promoter: -
- **A-** is a specific nucleotide sequence of DNA.
- **B-** DNA polymerase binds to it
- **C-** indicates where translation should begin
- **D-** both (A and B) are correct
- **49**-At which step of translation does the last tRNA leave the ribosome?
- **A-** elongation
- **B-** initiation
- **C-** termination
- **D-** disassembly
- **50**-Which of the following is correct regarding the structure of a DNA molecule?
- 1.the number of sugar molecules is equal to the number of the phosphate group molecules.
- 2. each nucleotide can differ from another nucleotide only in the type of nitrogenous base. 3.the nitrogenous base is connected to the phosphate group directly by a covalent bond.
- **A-**1, 2.
- **B-** 1, 3
- **C-** 2, 3
- **D-** 1. 2. 3

Kurdistan Region Government- Irag In the Name of Allah Ministry of Education-High Committee of General Examinations General exams for preparatory stage (Scientific) For the academic year (2024-2025) Second Sitting

Subject: BIOLOGY Time: 3.30 hours 12th Grade



Note: choose the correct answer: - (2 marks for each right answer)

1-In which of the following states the adrenaline is released? **B-**when a person is stressed **C-**after the threat period has passed.

A-low blood glucose concentration **D**- both (A and B) are correct

2-Rods differ from cones in that, rods: - **A-**are stimulated by bright light

B- contain rhodopsin.

C- initiate the production of sharp colors. **D-** respond to different colors 3-According to Mendel's experiments on pea plants, which of the following represents cross-pollination?

A- Tt × Tt **B-** TT × tt **C-** TT × TT **D-** All of them are correct

4-Skeletal muscles:

A- are not attached to the periosteum.

B- are directly attached to the periosteum.

C- are attached to the periosteum by a tendon.

D- both (B and C) are correct

5-According on the adjacent figure that shows the endometrium, maternal portion of placenta, and the fetal portion of placenta, choose the correct answer from the following:-

A- numbers 1 and 2 point to maternal veins,

B- numbers 1 and 2 point to maternal arteries,

C- number 1 points to an umbilical vein, and number 2 points a maternal vein

D- number 1 points to a maternal vein and the number 2 points to an umbilical artery

6-White blood cells are able to perform their function because:

A- they are capable of secreting blood clotting enzymes. **B-** they are formed in the red bone marrow

C- they can squeeze their way through openings in the walls of blood vessels into the intercellular fluid.

D- their nucleus and organelles disappear

7-Which of the following is **incorrect** regarding the cylinders in the structure of a long bone?

A- contains yellow bone marrow.

B- consists of lamellae.

C- it is a part of the compact bone. **D-** In the center of each cylinder there is a Haversian canal

8-vesicles fuse with the presynaptic membrane when?

A- neurotransmitters are broken down by enzymes.

B- an action potential reaches the axon terminal of the presynaptic neuron

C- neurotran'smitters are reabsorbed by a postsynaptic cell. **D-** the sodium-potassium pump is activated

9-The secretory cells and target cells of which of the following hormones are part of the same organ?

A- secretin

B- gastrin

C- parathyroid

D- calcitonin

10-Which of the following is a sequence of nucleotides in the template strand of a DNA molecule that is transcribed into a codon but then its not translated?

A-TAC

B- ACT

C- ATC

D- both (B and C) are correct

A- skeletal muscle movement

11-The motor division of the peripheral nervous system controls: -**B-** regulating smooth muscles **C-** secretion of all of the body's hormones directly **D-** both (A and B) are correct

12-Which of the following is correct regarding the vas deference?

A- it loops around the urethra.

B- each normal male person has two

C- transports semen to the urethra.

D- all of them are correct

13-Which of the following always presenting new antigens?

A- rhinoviruses

B- flu viruses

D- All of them are correct

14-Which of the following is correct regarding the diastole phase?

A- The direction of blood movement is from the atria to the ventricles.

B- It is represented by the P wave in the electrocardiograph (ECG).

C- It takes longer than the atrial contraction phase. **D-** Blood flows to fill the ventricles

15-In which principle of Koch's postulates principles, the pathogen is grown in the laboratory? **A-**1 and 3. **B-**2 and 4 **C-1** and 2. **D-**3 and 4.

16-In Mendelian genetics, an allele (factor) is considered as a dominant if:

A- able to express itself only in the homozygous state **B-** able to express itself only in the heterozygous state

C- able to mask the effect of the other allele (factor) in the heterozygous state

D- blending of two alleles occurs in the heterozygous state

17-Which of the following blood vessels contains (transports) dark red blood?

A- both superior and inferior vena cava **B-** Pulmonary veins **C-** Pulmonary artery **D-** both (A and C) are correct

18-All of the following are bones of the appendicular skeleton, **EXCEPT**: -

B- sternum C- fibula **A-** clavicle **D-** scapula

19-During the first trimester:

A- primary germ layers do not form. **B-** the four embryonic membranes are not formed

C- the mother does not feel the movement of the fetus. **D-** the heart does not start beating

20-The adjacent figure shows a part of the neuron axon, which of the following is correct regarding the movement of ions in their specific places on the figure across the neuron axon membrane?

	The movement of ions in their specific places on the figure across the neuron axon membrane		
Α	Sodium and potassium ions exit from the nerve cell		
В	Sodium and potassium ions enter the nerve cell		
С	Sodium ions exit from the nerve cell and potassium ions enter the nerve cell		
D	Sodium ions enter the nerve cell and potassium ions exit from the nerve cell		

Action potential directior				
+++	+++	+++		
	+++			
	Na⁺			

21-Which part of the cerebrum interprets touch information? **A-** cerebral cortex **B-** diencephalon.

C- midbrain. **D-** the part of the cerebrum that lies beneath the surface of the cerebral cortex

22-Which of the following defenses targets a specific type of pathogen?

A-mucous membranes **B-**inflammatory response **C-**specific defenses **D-**temperature response

23-The smooth muscle:

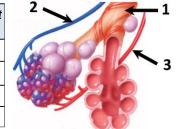
A- is found in the female reproductive tract.

B- is arranged in opposing pairs.

C- its muscle fibers are not surrounded by connective tissue. **D-** has both origin and insertion points

24-Based on the adjacent figure, choose the correct answer from the following table: -

	The blood in the blood vessel that is labeled by number 2: -	The blood in the blood vessel that is labeled by number 3: -	During exhalation the air in the structure that is labeled by number 1 passes into the: -
Α	comes from the right ventricle	returns to the left atrium	alveoli
В	returns to the left atrium	comes from the right ventricle	bronchus
С	comes from the right ventricle	returns to the left atrium	bronchus
D	returns to the right ventricle	comes from the left atrium	alveoli



25-All of the following is correct regarding the pivot joint, **EXCEPT**: -

A- it is a type of a movable joint.

B- it allows the body to bend and twist. **D-** it is found in the axial skeleton

C- it is found in the vertebral column.

26-Which of the following secretes estrogen? **A-** the mature egg **B-** corpus luteum

C- growing umbilical cord

D- All of them are correct

27-.....is a molecule that initiates changes inside a cell in response to the binding of a specific substance to a receptor on the outside (surface) of a cell? **C-** second messenger. **D-** hormone-receptor complex **A-** first messenger. **B-** receptor protein.

28-Antibodies bind to pathogens stopping their activity and destroying them: -

A- Indirectly by the specific defenses **B-** by preventing them from entering a cell, thereby blocking its reproduction.

C- by creating holes in the membranes of pathogen infected cells **D-** All of them are correct

29-The adjacent table shows the results of mixing several blood samples, which result in the following table is correct? Sample 1 Sample 2 The result Sample 1 Sample 2 The result (Donor) (Recipient) (the slide shape) (Donor) (Recipient) (the slide shape) A^{-} A+ В AB^{-} O⁺ AB⁺ B AB

30-In which of the following crosses, the genotype ratio of homozygous and heterozygous is equal to 1:1: -**A-** monohybrid cross (heterozygous × heterozygous) **B-** monohybrid cross (heterozygous × heterozygous) **C-** incomplete dominance (heterozygous × heterozygous) **D-** All of them are correct

D

31-Natural killer cells differ from neutrophils in that natural killer cells: -

A- are white blood cells.

C

O-

B- contribute to general defenses.

C- attack pathogen-infected cells with the pathogen.

D- Ingest pathogens

32-Which of the following is correct regarding the secondary immune response when a person is infected with the same pathogen for the second time?

A- protects the person from infecting with a new pathogen. **B-** memory cells are produced for the first time. **C-** memory cells immediately recognize it and begin to divide rapidly **D-** both (B and C) are correct

33-Which of the following secretes testosterone?

B- seminal vesicles A- testis

C- prostate gland

D- All of them are incorrect

34-All of the following occur in the fallopian tube, **EXCEPT**: -

B- formation of zygote **C**- meiosis *II* of the egg **D**- formation of first polar body **A-** formation of morula

35-The receptors that have tiny particles of calcium carbonate on top of them, are known as:-

A- mechanoreceptors. **B-** pain receptors.

C- chemoreceptors. **D-** photoreceptors **36-**In an addict person after removing cocaine from the synapse and dopamine release returns to normal.

the postsynaptic neuron: -**A-** is overstimulated **B-** is under stimulated

C- the number of receptor proteins on the postsynaptic cell decreases.

D- both (B and C) are correct

37-The tissue that forms the outer layer of blood vessels differs from the tissue that forms the inner layer of blood vessels in that the tissue that forms the outer laver of blood vessels -

A- its cells are characterized by cells that are embedded in large amounts of an intercellular substance

B- is a connective tissue

C- is an epithelial tissue

D- both (A and B) are correct

38-All of the following groups have a hormone that the site of secretion does not belong to them, **EXCEPT**: -

A- insulin, prostaglandin, glucagon. **B-** oxytocin, epinephrine, antidiuretic hormone **C-** aldosterone, cortisol, glucagon **D-** thyroid stimulating hormone, adrenocorticotropic hormone, follicle-stimulating hormone

39-All of the following secrete a fluid that reduces (decreases) friction, **EXCEPT**: -

A- pleura

B- diaphragm **C-** the tissue that lines the surfaces of the knee joint

D- pericardium

40-The two adjacent figures represent the results of the Hershey and Chase experiments,

in which experiment they used ³⁵S and in which experiment they used ³²P?

A- In the first experiment they used ³⁵S, in the second experiment they used ³²P

B- in the first experiment they used ³²P, in the second experiment they used ³⁵S

C- in both experiments they used ³⁵S

D- in both experiments they used ³²P

Experiment 1 Experiment 2

41-At which step of translation does the last tRNA leave the ribosome?

A- elongation

B- initiation

C- termination

D- disassembly

42-Which of the following is correct regarding the structure of a DNA molecule?

1.the number of sugar molecules is equal to the number of the phosphate group molecules.

2. each nucleotide can differ from another nucleotide only in the type of nitrogenous base.

3.the nitrogenous base is connected to the phosphate group directly by a covalent bond.

A-1. 2. **B-** 1. 3 **C-** 2, 3

D- 1. 2. 3

43-Test cross determines the genotype of any individual who expresses the: -

A- dominant phenotype.

B- recessive phenotype

C- dominant phenotype and recessive phenotype

D- intermediate phenotype

44-Which of the following is **incorrect** regarding the process of protein synthesis in eukaryotes?

A-by using the codon table, the codon GCU specifies the amino acid alanine in the genetic code of all living organisms

B- In the transcription, a part of one of the two DNA strands is used to transcribe tRNA

C- The translation can begin even before transcription has finished **D-** transcription takes place in the nucleus.

45-The promoter differs from the start codon in that the promoter: -

A- is a specific nucleotide sequence of DNA.

B- DNA polymerase binds to it

C- indicates where translation should begin

D- both (A and B) are correct

henylalanine

Codons in mRNA

First base

U

46-According to the adjacent codon table, if this DNA sequence (CTCAAGTGCTTC) complements the strand that serves as a template to make mRNA, which of the following polypeptides is produced?

A- Leucine – Tyrosine – Arginine – Phenylalanine

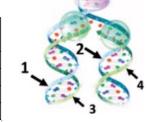
B- Valine – Aspartic Acid – Proline – Histidine

C- Leucine – Lysine – Cysteine – Phenylalanine **D-** Proline – Glutamic Acid – Leucine – valine

C Aspartic acid Aspartic acid Glutamic acid G

47- According to the adjacent figure that shows the process of DNA replication, after completing this process, which of the choices in the following table is correct regarding the ratio of pyrimidines and the ratio of purines?

	The ratio of pyrimidines in theis equal to the ratio of purines in the	The ratio of pyrimidines in theis <u>NOT EQUAL</u> to the ratio of purines in the
Α	Strand 2 , strand 4	Strand 1 , strand 3
В	Strand 1 , strand 4	Strand 2 , strand 4
С	Strand 2 , strand 3	Strand 3 , strand 4
D	Strand 1 , strand 3	Strand 2 , strand 3



48-In the 28-day period of the ovarian and menstrual cycles, which of the following occurs one after the other (in sequence)? (1- Secretion of follicle-stimulating hormone, 2- Formation of corpus luteum, 3- Growth and development of the follicle, 4- Ovulation, 5- The sharp rise in the concentration of luteinizing hormone)

C-3 > 1 > 2 > 5 > 4

D-1 3 > 2 > 5 > 4

49-In a monohybrid cross, if half of the resulting offspring show the dominant trait, the genotype of the parents:

A- both are heterozygous. **B-** one is heterozygous and the other is homozygous dominant

C- one is heterozygous and the other is recessive.

D- both are homozygous

50-In a dihybrid cross between two pea plants, one has short stem and axial flowers and the other is unknown for both traits, these ratios produced (1 short stem plant and axial flowers: 1 short stem plant and terminal flowers). which of the following represents the phenotype of the unknown plant:-

A- short stem and terminal flowers

B- tall stem and terminal flowers

C- short stem and axial flowers

D-tall stem and axial flowers

Kurdistan Region Government- Irag In the Name of Allah Ministry of Education-High Committee of General Examinations General exams for preparatory stage (Scientific)

For the academic year (2024-2025) Second Sitting

Subject: BIOLOGY Time: 3.30 hours 12th Grade



Note: choose the correct answer: - (2 marks for each right answer)

1-Which of the following always presenting new antigens?

A- rhinoviruses **B-** flu viruses

D- All of them are correct

2-Rods differ from cones in that, rods: - **A**-are stimulated by bright light

B- contain rhodopsin. **C-** initiate the production of sharp colors. **D-** respond to different colors

3-In which of the following crosses, the genotype ratio of homozygous and heterozygous is equal to 1:1: -**A-** monohybrid cross (heterozygous × heterozygous) **B-** monohybrid cross (heterozygous × heterozygous)

C- incomplete dominance (heterozygous × heterozygous) **D-** All of them are correct

4-Which of the following secretes estrogen?

A- the mature egg **B-** corpus luteum

C- growing umbilical cord

D- All of them are correct

5-Which part of the cerebrum interprets touch information? **A-** cerebral cortex **B-** diencephalon. **C-** midbrain. **D-** the part of the cerebrum that lies beneath the surface of the cerebral cortex

6-All of the following is correct regarding the pivot joint, **EXCEPT**: -

A- it is a type of a movable joint.

B- it allows the body to bend and twist.

C- it is found in the vertebral column.

D- it is found in the axial skeleton

7-Antibodies bind to pathogens stopping their activity and destroying them: -

A- Indirectly by the specific defenses **B-** by preventing them from entering a cell, thereby blocking its reproduction.

C- by creating holes in the membranes of pathogen infected cells **D-** All of them are correct

8-In which of the following states the adrenaline is released? **A-**low blood glucose concentration

B-when a person is stressed **C-**after the threat period has passed. **D-** both (A and B) are correct

9-In which principle of Koch's postulates principles, the pathogen is grown in the laboratory?

A-1 and 3. **B-**2 and 4 **C-1** and 2.

D-3 and 4.

10-All of the following groups have a hormone that the site of secretion does not belong to them, **EXCEPT**: -

A- insulin, prostaglandin, glucagon. **B-** oxytocin, epinephrine, antidiuretic hormone **C-** aldosterone, cortisol, glucagon

D- thyroid stimulating hormone, adrenocorticotropic hormone, follicle-stimulating hormone

11-Which of the following blood vessels contains (transports) dark red blood?

A- both superior and inferior vena cava B- Pulmonary veins C- Pulmonary artery D- both (A and C) are correct

12-Which of the following secretes testosterone?

A- testis **B-** seminal vesicles **C-** prostate gland

D- All of them are incorrect

13-In an addict person after removing cocaine from the synapse and dopamine release returns to normal, the postsynaptic neuron: -**A-** is overstimulated **B-** is under stimulated

C- the number of receptor proteins on the postsynaptic cell decreases.

D- both (B and C) are correct

14-In Mendelian genetics, an allele (factor) is considered as a dominant if:

A- able to express itself only in the homozygous state **B-** able to express itself only in the heterozygous state

C- able to mask the effect of the other allele (factor) in the heterozygous state

D- blending of two alleles occurs in the heterozygous state

15-The adjacent table shows the results of mixing several blood samples, which result in the following table is

correct?

	Sample 1 (Donor)	Sample 2 (Recipient)	The result (the slide shape)
Α	A -	A ⁺	
С	0-	AB+	

		Sample 2 (Recipient)	The result (the slide shape)
В	AB ⁻	O ⁺	
D	B⁻	AB ⁻	

16-Skeletal muscles:

A- are not attached to the periosteum.

B- are directly attached to the periosteum.

C- are attached to the periosteum by a tendon.

D- both (B and C) are correct

17-All of the following secrete a fluid that reduces (decreases) friction, EXCEPT: -

A- pleura **B-** diaphragm **C-** the tissue that lines the surfaces of the knee joint **D-** pericardium

18-During the first trimester:

A- primary germ layers do not form. **B-** the four embryonic membranes are not formed

C- the mother does not feel the movement of the fetus.

D- the heart does not start beating

19-All of the following occur in the fallopian tube. **EXCEPT**: -

A- formation of morula **B-** formation of zygote **C-** meiosis II of the egg **D-** formation of first polar body

20-Which of the following is correct regarding the vas deference?

A- it loops around the urethra.

B- each normal male person has two

C- transports semen to the urethra.

D- all of them are correct

21-The motor division of the peripheral nervous system controls: -**A-** skeletal muscle movement

B- regulating smooth muscles **C-** secretion of all of the body's hormones directly **D-** both (A and B) are correct

22-Which of the following is correct regarding the diastole phase?

A- The direction of blood movement is from the atria to the ventricles.

B- It is represented by the P wave in the electrocardiograph (ECG).

C- It takes longer than the atrial contraction phase. **D-** Blood flows to fill the ventricles

23-The receptors that have tiny particles of calcium carbonate on top of them, are known as:-

A- mechanoreceptors. **B-** pain receptors. **C-** chemoreceptors. **D-** photoreceptors

24-.....is a molecule that initiates changes inside a cell in response to the binding of a specific substance to a receptor on the outside (surface) of a cell?

A- first messenger. **B-** receptor protein. **C-** second messenger. **D-** hormone-receptor complex

25-Natural killer cells differ from neutrophils in that natural killer cells: -A- are white blood cells.

B- contribute to general defenses.

C- attack pathogen-infected cells with the pathogen.

D- Ingest pathogens

26-Which of the following defenses targets a specific type of pathogen? **A-**mucous membranes **B-**inflammatory response

C-specific defenses **D-**temperature response

27-vesicles fuse with the presynaptic membrane when?

A- neurotransmitters are broken down by enzymes.

B- an action potential reaches the axon terminal of the presynaptic neuron

C- neurotransmitters are reabsorbed by a postsynaptic cell. **D-** the sodium-potassium pump is activated

28-According on the adjacent figure that shows the endometrium, maternal portion of placenta, and the fetal portion of placenta, choose the correct answer from the following:-

A- numbers 1 and 2 point to maternal veins,

B- numbers 1 and 2 point to maternal arteries,

C- number 1 points to an umbilical vein, and number 2 points a maternal vein

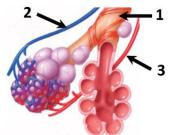
D- number 1 points to a maternal vein and the number 2 points to an umbilical artery

29-Which of the following is correct regarding the secondary immune response when a person is infected with the same pathogen for the second time?

A- protects the person from infecting with a new pathogen. **B-** memory cells are produced for the first time. **C-** memory cells immediately recognize it and begin to divide rapidly **D-** both (B and C) are correct

30-Based on the adjacent figure, choose the correct answer from the following table: -

	The blood in the blood vessel that is labeled by number 2: -	The blood in the blood vessel that is labeled by number 3: -	During exhalation the air in the structure that is labeled by number 1 passes into the: -
Α	comes from the right ventricle	returns to the left atrium	alveoli
В	returns to the left atrium	comes from the right ventricle	bronchus
С	comes from the right ventricle	returns to the left atrium	bronchus
D	returns to the right ventricle	comes from the left atrium	alveoli



 31-Which of the following is incorrect regarding the cylinders in the structure of a long bone? A- contains yellow bone marrow. B- consists of lamellae. C- it is a part of the compact bone. D- In the center of each cylinder there is a Haversian canal 	 43-The promoter differs from the start codon in that the promoter: - A- is a specific nucleotide sequence of DNA. B- DNA polymerase binds to it C- indicates where translation should begin D- both (A and B) are correct
32- The smooth muscle: A- is found in the female reproductive tract. B- is arranged in opposing pairs.	44-At which step of translation does the last tRNA leave the ribosome?
C- its muscle fibers are not surrounded by connective tissue. D- has both origin and insertion points 33-All of the following are bones of the appendicular skeleton, EXCEPT: - A- clavicle B- sternum C- fibula D- scapula	A- elongation B- initiation C- termination D- disassembly 45- According to the adjacent figure that shows the process of DNA replication, after completing this process, which of the choices in the following table is correct regarding the ratio of pyrimidines and the ratio of purines?
34- The secretory cells and target cells of which of the following hormones are part of the same organ? A- secretin B- gastrin C- parathyroid D- calcitonin	The ratio of pyrimidines in theis equal to the ratio of The ratio of pyrimidines in theis NOT EQUAL to the
35-White blood cells are able to perform their function because:A- they are capable of secreting blood clotting enzymes.B- they are formed in the red bone marrow	purines in the ratio of purines in the A Strand 2 , strand 4 Strand 3 1
C- they can squeeze their way through openings in the walls of blood vessels into the intercellular fluid. D- their nucleus and organelles disappear	B Strand 1 , strand 4 Strand 2 , strand 4 C Strand 2 , strand 3 Strand 3 , strand 4
36- The adjacent figure shows a part of the neuron axon, which of the following is correct regarding the movement of ions in their specific places on the figure across the neuron axon membrane?	Strand 1 , strand 3 Strand 2 , strand 3 46-According to the adjacent codon table, if this DNA sequence (CTCAAGTGCTTC) complements the
The movement of ions in their specific places on the figure across the neuron axon membrane Action potential direction	strand that serves as a template to make mRNA, which of the following polypeptides U Phenylalanine Serine Tyrosine Cysteine Cyste
A Sodium and potassium ions exit from the nerve cell	is produced? C Leucine Proline Histidine Arginine Argin
B Sodium and potassium ions enter the nerve cell	A- Leucine — Tyrosine — Arginine — Prientylalanine Isoleucine Threonine Asparagine Serine U
C Sodium ions exit from the nerve cell and potassium ions enter the nerve cell Sodium ions enter the nerve cell and potassium ions exit from the nerve cell K ⁺ Na ⁺	B- Valine — Aspartic Acid — Proline — Histidine A Isoleucine Threonine Lysine Arginine A Methionine (start) Threonine Lysine Arginine G G
Sodium ions enter the nerve cell and potassium ions exit from the nerve cell 37-Which of the following is a sequence of nucleotides in the template strand of a DNA molecule that is	C- Leucine — Lysine — Cysteine — Phenylalanine D- Proline — Glutamic Acid — Leucine — valine O- Proline — Glutamic Acid — Leucine — valine O- Proline — Glutamic Acid — Glycine — Alanine — Alanin
transcribed into a codon but then its not translated? A-TAC B-ACT C-ATC D-both (B and C) are correct 38-According to Mendel's experiments on pea plants, which of the following represents cross-pollination? A-Ti × Ti B-TT × ti C-TT × TT D-All of them are correct 39-The tissue that forms the outer layer of blood vessels differs from the tissue that forms the inner layer of blood vessels in that the tissue that forms the outer layer of blood vessels - A- its cells are characterized by cells that are embedded in large amounts of an intercellular substance B- is a connective tissue C- is an epithelial tissue D- both (A and B) are correct 40-The two adjacent figures represent the results of the Hershey and Chase experiments, in which experiment they used ³⁵ S and in which experiment they used ³² P? A- In the first experiment they used ³⁵ S, in the second experiment they used ³² P B- in the first experiments they used ³² P, in the second experiment they used ³⁵ S C- in both experiments they used ³² P Find the first experiment they used ³² P 41-In a dihybrid cross between two pea plants, one has short stem and axial flowers and the other is unknown for both traits, these ratios produced (1 short stem plant and axial flowers: 1 short stem plant and terminal flowers), which of the following represents the phenotype of the unknown plant:- A- short stem and terminal flowers C- short stem and axial flowers D-tall stem and axial flowers	47-Which of the following is incorrect regarding the process of protein synthesis in eukaryotes? A-by using the codon table, the codon GCU specifies the amino acid alanine in the genetic code of all living organisms B- In the transcription, a part of one of the two DNA strands is used to transcribe tRNA C- The translation can begin even before transcription has finished D- transcription takes place in the nucleus. 48-Test cross determines the genotype of any individual who expresses the: A- dominant phenotype. C- dominant phenotype and recessive phenotype D- intermediate phenotype 49-In a monohybrid cross, if half of the resulting offspring show the dominant trait, the genotype of the parents: A- both are heterozygous. B- one is heterozygous and the other is homozygous dominant C- one is heterozygous and the other is recessive. D- both are homozygous 50-In the 28-day period of the ovarian and menstrual cycles, which of the following occurs one after the other (in sequence)? (1- Secretion of follicle-stimulating hormone, 2- Formation of corpus luteum, 3- Growth and development of the follicle, 4- Ovulation, 5- The sharp rise in the concentration of luteinizing hormone) A-2 1 3 5 4 B-1 3 5 4 D-1 3 2 5 4 C-3 1 2 5 4 D-1 3 2 5 4
42- Which of the following is correct regarding the structure of a DNA molecule? 1.the number of sugar molecules is equal to the number of the phosphate group molecules.	
2. each nucleotide can differ from another nucleotide only in the type of nitrogenous base.	
3.the nitrogenous base is connected to the phosphate group directly by a covalent bond.	
A-1 , 2. B-1 , 3 C-2 , 3 D-1 , 2, 3	

Kurdistan Region Government- Irag Ministry of Education-High Committee of General Examinations General exams for preparatory stage (Scientific)

For the academic year (2024-2025) Second Sitting

In the Name of Allah





Note: choose the correct answer: - (2 marks for each right answer)

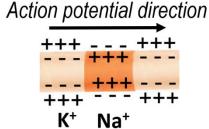
- **1-**Which of the following is **incorrect** regarding the cylinders in the structure of a long bone?
- **A-** contains yellow bone marrow.
- **B-** consists of lamellae.
- **C-** it is a part of the compact bone.
- **D-** In the center of each cylinder there is a Haversian canal

12th Grade

- **2-**Natural killer cells differ from neutrophils in that natural killer cells: -
- **A-** are white blood cells.

- **B-** contribute to general defenses.
- **C-** attack pathogen-infected cells with the pathogen. **D-** Ingest pathogens
- **3-**According on the adjacent figure that shows the endometrium, maternal portion of placenta, and the fetal portion of placenta, choose the correct answer from the following:-
- **A-** numbers 1 and 2 point to maternal veins,
- **B-** numbers 1 and 2 point to maternal arteries,
- **C-** number 1 points to an umbilical vein, and number 2 points a maternal vein
- **D-** number 1 points to a maternal vein and the number 2 points to an umbilical artery
- **4-**The adjacent figure shows a part of the neuron axon, which of the following is correct regarding the movement of ions in their specific places on the figure across the neuron axon membrane?

	The movement of ions in their specific places on the figure across the neuron axon membrane
Α	Sodium and potassium ions exit from the nerve cell
В	Sodium and potassium ions enter the nerve cell
С	Sodium ions exit from the nerve cell and potassium ions enter the nerve cell
D	Sodium ions enter the nerve cell and potassium ions exit from the nerve cell



5-Which of the following is a sequence of nucleotides in the template strand of a DNA molecule that is transcribed into a codon but then its not translated?

A-TAC

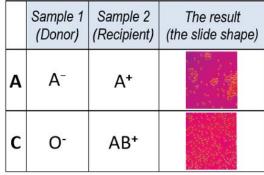
- **B-** ACT
- C- ATC
- **D-** both (B and C) are correct
- **6-**In Mendelian genetics, an allele (factor) is considered as a dominant if:
- **A-** able to express itself only in the homozygous state **B-** able to express itself only in the heterozygous state
- **C-** able to mask the effect of the other allele (factor) in the heterozygous state
- **D-** blending of two alleles occurs in the heterozygous state
- **7-**The tissue that forms the outer layer of blood vessels differs from the tissue that forms the inner layer of blood vessels in that the tissue that forms the outer layer of blood vessels -
- A- its cells are characterized by cells that are embedded in large amounts of an intercellular substance **C-** is an epithelial tissue **B-** is a connective tissue

- **D-** both (A and B) are correct

- **8-**Which of the following secretes estrogen?
- **A-** the mature egg **B-** corpus luteum
- **C-** growing umbilical cord
- **D-** All of them are correct
- **9-**In which principle of Koch's postulates principles, the pathogen is grown in the laboratory? **B-**2 and 4 **C-1** and 2. **D-**3 and 4.
- **A-**1 and 3.

- **10-**The secretory cells and target cells of which of the following hormones are part of the same organ? **C-** parathyroid **B-** gastrin **D-** calcitonin A- secretin
- **11**-Which part of the cerebrum interprets touch information? **A**-cerebral cortex **B-** diencephalon. **C-** midbrain. **D-** the part of the cerebrum that lies beneath the surface of the cerebral cortex
- **12-**All of the following occur in the fallopian tube, **EXCEPT**: -
- **A-** formation of morula **B-** formation of zygote **C-** meiosis II of the egg **D-** formation of first polar body
- **13**-Which of the following blood vessels contains (transports) dark red blood?
- A- both superior and inferior vena cava B- Pulmonary veins C- Pulmonary artery D- both (A and C) are correct
- **14-**All of the following are bones of the appendicular skeleton, **EXCEPT**: -
- A- clavicle
- **B-** sternum
- **C-** fibula

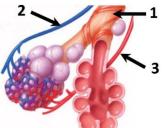
15-The adjacent table shows the results of mixing several blood samples, which result in the following table is correct?



		Sample 2 (Recipient)	The result (the slide shape)
В	AB ⁻	O ⁺	
D	B-	AB⁻	

- **16**-Which of the following is correct regarding the diastole phase?
- **A-** The direction of blood movement is from the atria to the ventricles.
- **B-** It is represented by the P wave in the electrocardiograph (ECG).
- C- It takes longer than the atrial contraction phase. D- Blood flows to fill the ventricles
- **17-**Rods differ from cones in that, rods: **A-**are stimulated by bright light **B-** contain rhodopsin.
 - **C-** initiate the production of sharp colors. **D-** respond to different colors
- **18-**Based on the adjacent figure, choose the correct answer from the following table: -

	The blood in the blood vessel that is labeled by number 2: -	The blood in the blood vessel that is labeled by number 3: -	During exhalation the air in the structure that is labeled by number 1 passes into the: -
Α	comes from the right ventricle	returns to the left atrium	alveoli
В	returns to the left atrium	comes from the right ventricle	bronchus
С	comes from the right ventricle	returns to the left atrium	bronchus
D	returns to the right ventricle	comes from the left atrium	alveoli



- 19-Skeletal muscles:
- **A-** are not attached to the periosteum.
- **B-** are directly attached to the periosteum. **D-** both (B and C) are correct
- **C-** are attached to the periosteum by a tendon.
- **20-**In which of the following states the adrenaline is released? **A-**low blood glucose concentration **D-** both (A and B) are correct **B-**when a person is stressed C-after the threat period has passed.
- **21-**Which of the following is correct regarding the secondary immune response when a person is infected with the same pathogen for the second time?
- **A-** protects the person from infecting with a new pathogen. **B-** memory cells are produced for the first time.
- C- memory cells immediately recognize it and begin to divide rapidly D- both (B and C) are correct
- 22-All of the following secrete a fluid that reduces (decreases) friction, EXCEPT: -
- **B-** diaphragm **C-** the tissue that lines the surfaces of the knee joint **D-** pericardium
- **23**-Which of the following secretes testosterone?
- **B-** seminal vesicles **A-** testis
- **C-** prostate gland
- **D-** All of them are incorrect
- **24-**The motor division of the peripheral nervous system controls: -
- A- skeletal muscle movement **B-** regulating smooth muscles 'C- secretion of all of the body's hormones directly **D-** both (A and B) are correct
- **25-**In which of the following crosses, the genotype ratio of homozygous and heterozygous is equal to 1:1: -
- **A-** monohybrid cross (heterozygous × heterozygous) **B-** monohybrid cross (heterozygous × heterozygous)
- **C-** incomplete dominance (heterozygous × heterozygous) **D-** All of them are correct **26-**Antibodies bind to pathogens stopping their activity and destroying them: -
- **A-** Indirectly by the specific defenses **B-** by preventing them from entering a cell, thereby blocking its reproduction. **D-** All of them are correct
- **C-** by creating holes in the membranes of pathogen infected cells **27**-vesicles fuse with the presynaptic membrane when?
- **A-** neurotransmitters are broken down by enzymes. **B-** an action potential reaches the axon terminal of the presynaptic neuron
- **C-** neurotran'smitters are reabsorbed by a postsynaptic cell. **D-** the sodium-potassium pump is activated
- **28-**All of the following is correct regarding the pivot joint. **EXCEPT**: -
 - **B-** it allows the body to bend and twist.
- **A-** it is a type of a movable joint. **C-** it is found in the vertebral column.
- **D-** it is found in the axial skeleton

29is a molecule that initiates changes inside a cell in response to the binding of a specific substance to a receptor on the outside (surface) of a cell? A-first messenger. P-receptor protein. C-second messenger. D-hormone-receptor complex 30-In an addict person after removing cocaine from the synapse and dopamine release returns to normal, the postsynaptic neuron: - A-is overstimulated B- is under stimulated C-the number of receptor proteins on the postsynaptic cell decreases. D-both (B and C) are correct 31-During the first trimester. A-primary germ layers do not form. B- the four embryonic membranes are not formed C-the mother does not feel the movement of the fetus. D- the heart does not start beating 32-The smooth muscle: A-is found in the female reproductive tract. B-is arranged in opposing pairs. C- its muscle fibers are not surrounded by connective tissue. D- has both origin and insertion points 33-According to Mendel's experiments on pea plants, which of the following represents cross-pollination? A-TI × TI B-TI × tt C-TI × TI D-All of them are correct 34-The receptors that have tiny particles of calcium canbonate on top of them, are known as: A-mechanoreceptors. B-pain receptors. C-chemoreceptors. D-photoreceptors 35-Which of the following is correct regarding the vas deference? A-it loops around the urethra. B-each normal male person has two C-transports semen to the urethra. B-each normal male person has two C-transports semen to the urethra. B-each normal male person has two C-transports semen to the urethra. D-all of them are correct 37-Which of the following always presenting new artiguns? A-finitoriuses B-fill viruses C-HIV D-All of them are correct 38-Vinich of the following always presenting new artiguns? A-finitoriuses B-fill viruses C-HIV D-All of them are correct D-All	43- According to the adjacent figure that shows the process of DNA replication, after completing this process, which of the choices in the following table is correct regarding the ratio of pyrimidines and the ratio of purines? The ratio of pyrimidines in the is equal to the ratio of purines in the is NOT EQUAL to the purines in the is NOT EQUAL to the ratio of pyrimidines in the is NOT EQUAL to the part of pyrimidines in the is NOT EQUAL to the part of pyrimidines in the is NOT EQUAL to the part of pyrimidines in the is NOT EQUAL to the part of the phosphate group molecules. 4. Eucline - Lysine - Aspartic Acid - Proline - Histoline C- Leucine - Lysine - Cysteine - Phenylalanine D- Proline - Glutamic Acid - Leucine - Valine - Phenylalanine D- Proline - Glutamic Acid - Leucine - Phenylalanine D-

Kurdistan Region Government- Irag In the Name of Allah Ministry of Education-High Committee of General Examinations General exams for preparatory stage (Scientific) For the academic year (2024-2025) Second Sitting

Subject: BIOLOGY Time: 3.30 hours 12th Grade



Note: choose the correct answer: - (2 marks for each right answer)

1-Which of the following blood vessels contains (transports) dark red blood?

A- both superior and inferior vena cava B- Pulmonary veins C- Pulmonary artery D- both (A and C) are correct

2-All of the following occur in the fallopian tube. **EXCEPT**: -

A- formation of morula

B- formation of zygote **C-** meiosis II of the egg **D-** formation of first polar body

3-According to Mendel's experiments on pea plants, which of the following represents cross-pollination?

A- Tt × Tt **B-** TT × tt C- TT × TT **D-** All of them are correct

4-Rods differ from cones in that, rods: - **A-**are stimulated by bright light **B-** contain rhodopsin. **C-** initiate the production of sharp colors. **D-** respond to different colors

5-Which of the following defenses targets a specific type of pathogen?

A-mucous membranes **B-**inflammatory response

C-specific defenses

D-temperature response

6-vesicles fuse with the presynaptic membrane when?

A- neurotransmitters are broken down by enzymes.

B- an action potential reaches the axon terminal of the presynaptic neuron

C- neurotransmitters are reabsorbed by a postsynaptic cell. **D-** the sodium-potassium pump is activated

7-The adjacent figure shows a part of the neuron axon, which of the following is correct regarding the movement of ions in their specific places on the figure across the neuron axon membrane?

	The movement of ions in their specific places on the figure across the neuron axon membrane
Α	Sodium and potassium ions exit from the nerve cell
В	Sodium and potassium ions enter the nerve cell
С	Sodium ions exit from the nerve cell and potassium ions enter the nerve cell
D	Sodium ions enter the nerve cell and potassium ions exit from the nerve cell

Action potential direction Na⁺

8-Which of the following is **incorrect** regarding the cylinders in the structure of a long bone?

A- contains yellow bone marrow.

B- consists of lamellae.

C- it is a part of the compact bone.

D- In the center of each cylinder there is a Haversian canal

9-Skeletal muscles:

A- are not attached to the periosteum.

B- are directly attached to the periosteum.

C- are attached to the periosteum by a tendon.

D- both (B and C) are correct

10-Which of the following is a sequence of nucleotides in the template strand of a DNA molecule that is transcribed into a codon but then its not translated?

A-TAC

B- ACT

C- ATC

D- both (B and C) are correct

11-All of the following are bones of the appendicular skeleton, **EXCEPT**: -

A- clavicle

B- sternum

C- fibula

12-According on the adjacent figure that shows the endometrium, maternal portion of placenta, and the fetal portion of placenta, choose the correct answer from the following:-

A- numbers 1 and 2 point to maternal veins,

B- numbers 1 and 2 point to maternal arteries,

C- number 1 points to an umbilical vein, and number 2 points a maternal vein

D- number 1 points to a maternal vein and the number 2 points to an umbilical artery

13-The secretory cells and target cells of which of the following hormones are part of the same organ?

A- secretin

B- gastrin

C- parathyroid

D- calcitonin

14-All of the following is correct regarding the pivot joint. **EXCEPT**: -

A- it is a type of a movable joint.

B- it allows the body to bend and twist.

C- it is found in the vertebral column.

D- it is found in the axial skeleton

15-All of the following secrete a fluid that reduces (decreases) friction, EXCEPT: -

B- diaphragm **C-** the tissue that lines the surfaces of the knee joint **D-** pericardium **A-** pleura

16-During the first trimester:

A- primary germ layers do not form. **B-** the four embryonic membranes are not formed

C- the mother does not feel the movement of the fetus. **D-** the heart does not start beating

17-Which of the following is correct regarding the vas deference?

A- it loops around the urethra. **B-** each normal male person has two

D- all of them are correct **C-** transports semen to the urethra.

18-In which of the following crosses, the genotype ratio of homozygous and heterozygous is equal to 1:1: -

A- monohybrid cross (heterozygous × heterozygous) **B-** monohybrid cross (heterozygous × heterozygous) **C-** incomplete dominance (heterozygous × heterozygous) **D-** All of them are correct

19-Which of the following is correct regarding the diastole phase?

A- The direction of blood movement is from the atria to the ventricles.

B- It is represented by the P wave in the electrocardiograph (ECG).

C- It takes longer than the atrial contraction phase. **D-** Blood flows to fill the ventricles

20-In which principle of Koch's postulates principles, the pathogen is grown in the laboratory?

B-2 and 4 **C-1** and 2. **A-**1 and 3. **D-**3 and 4.

21-The tissue that forms the outer layer of blood vessels differs from the tissue that forms the inner layer of blood vessels in that the tissue that forms the outer layer of blood vessels -

A- its cells are characterized by cells that are embedded in large amounts of an intercellular substance **D-** both (A and B) are correct

B- is a connective tissue **C-** is an epithelial tissue

22-Which of the following always presenting new antigens? **B-** flu viruses **A-** rhinoviruses

23-Which of the following secretes estrogen?

C- growing umbilical cord **B-** corpus luteum **D-** All of them are correct **A-** the mature egg

24-All of the following groups have a hormone that the site of secretion does not belong to them. **EXCEPT**: -

A- insulin, prostaglandin, glucagon. B- oxytocin, epinephrine, antidiuretic hormone C- aldosterone, cortisol, glucagon

D- thyroid stimulating hormone, adrenocorticotropic hormone, follicle-stimulating hormone

25-The motor division of the peripheral nervous system controls: -**A-** skeletal muscle movement **B-** regulating smooth muscles **C-** secretion of all of the body's hormones directly **D-** both (A and B) are correct

26-Which part of the cerebrum interprets touch information? **A-** cerebral cortex **B-** diencephalon.

C- midbrain. D- the part of the cerebrum that lies beneath the surface of the cerebral cortex

27-Which of the following is correct regarding the secondary immune response when a person is infected with the same pathogen for the second time?

A- protects the person from infecting with a new pathogen. **B-** memory cells are produced for the first time. **C-** memory cells immediately recognize it and begin to divide rapidly **D-** both (B and C) are correct

28-Antibodies bind to pathogens stopping their activity and destroying them: -

A- Indirectly by the specific defenses **B-** by preventing them from entering a cell, thereby blocking its reproduction.

C- by creating holes in the membranes of pathogen infected cells **D-** All of them are correct

29-The receptors that have tiny particles of calcium carbonate on top of them, are known as:-**A-** mechanoreceptors. **B-** pain receptors. **C-** chemoreceptors. **D-** photoreceptors

30-Which of the following secretes testosterone? **A-** testis

B- seminal vesicles C- prostate gland

D- All of them are incorrect

31-Natural killer cells differ from neutrophils in that natural killer cells: -

A- are white blood cells. **C-** attack pathogen-infected cells with the pathogen.

B- contribute to general defenses.

D- All of them are correct

D- Ingest pathogens

32-The adjacent table shows the results of mixing several blood samples, which result in the following table is correct?

	Sample 1 (Donor)	Sample 2 (Recipient)	The result (the slide shape)
Α	A -	A ⁺	
С	0-	AB+	

		Sample 2 (Recipient)	The result (the slide shape)
В	AB ⁻	O ⁺	
D	B-	AB ⁻	

33-White blood cells are able to perform their function because:

A- they are capable of secreting blood clotting enzymes. **B-** they are formed in the red bone marrow

C- they can squeeze their way through openings in the walls of blood vessels into the intercellular fluid.

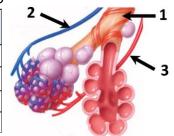
D- their nucleus and organelles disappear

34-In an addict person after removing cocaine from the synapse and dopamine release returns to normal, the postsynaptic neuron: -**A-** is overstimulated **B-** is under stimulated

C- the number of receptor proteins on the postsynaptic cell decreases. **D-** both (B and C) are correct

35-Based on the adjacent figure, choose the correct answer from the following table: -

	The blood in the blood vessel that is labeled by number 2: -	The blood in the blood vessel that is labeled by number 3: -	During exhalation the air in the structure that is labeled by number 1 passes into the: -
Α	comes from the right ventricle	returns to the left atrium	alveoli
В	returns to the left atrium	comes from the right ventricle	bronchus
С	comes from the right ventricle	returns to the left atrium	bronchus
D	returns to the right ventricle	comes from the left atrium	alveoli



36-The smooth muscle:

A- is found in the female reproductive tract. **B-** is arranged in opposing pairs.

C- its muscle fibers are not surrounded by connective tissue. **D-** has both origin and insertion points

37-In Mendelian genetics, an allele (factor) is considered as a dominant if:

A- able to express itself only in the homozygous state **B-** able to express itself only in the heterozygous state

C- able to mask the effect of the other allele (factor) in the heterozygous state

D- blending of two alleles occurs in the heterozygous state

38-In which of the following states the adrenaline is released? **A-**low blood glucose concentration **C-**after the threat period has passed. **B-**when a person is stressed **D-** both (A and B) are correct

39-.....is a molecule that initiates changes inside a cell in response to the binding of a specific substance to a receptor on the outside (surface) of a cell?

A- first messenger. **B-** receptor protein. **C-** second messenger. **D-** hormone-receptor complex

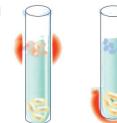
40-The two adjacent figures represent the results of the Hershey and Chase experiments, in which experiment they used ³⁵S and in which experiment they used ³²P?

A- In the first experiment they used ³⁵S, in the second experiment they used ³²P

B- in the first experiment they used ³²P, in the second experiment they used ³⁵S

C- in both experiments they used ³⁵S

D- in both experiments they used ³²P





Experiment 1 Experiment 2

41-In a dihybrid cross between two pea plants, one has short stem and axial flowers and the other is unknown for both traits, these ratios produced (1 short stem plant and axial flowers: 1 short stem plant and terminal flowers). which of the following represents the phenotype of the unknown plant:-

A- short stem and terminal flowers

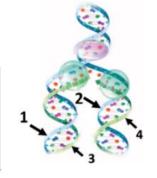
B- tall stem and terminal flowers

C- short stem and axial flowers

D-tall stem and axial flowers

42- According to the adjacent figure that shows the process of DNA replication, after completing this process, which of the choices in the following table is correct regarding the ratio of pyrimidines and the ratio of purines?

	The ratio of pyrimidines in theis equal to the ratio of purines in the	The ratio of pyrimidines in theis <u>NOT EQUAL</u> to the ratio of purines in the
Α	Strand 2 , strand 4	Strand 1 , strand 3
В	Strand 1 , strand 4	Strand 2 , strand 4
С	Strand 2 , strand 3	Strand 3 , strand 4
D	Strand 1 , strand 3	Strand 2 , strand 3



43-Which of the following is correct regarding the structure of a DNA molecule?

1.the number of sugar molecules is equal to the number of the phosphate group molecules.

2. each nucleotide can differ from another nucleotide only in the type of nitrogenous base.

3.the nitrogenous base is connected to the phosphate group directly by a covalent bond.

A-1, 2.

B- 1, 3

C- 2. 3

D- 1, 2, 3

44-Test cross determines the genotype of any individual who expresses the: -

A- dominant phenotype.

B- recessive phenotype

C- dominant phenotype and recessive phenotype

D- intermediate phenotype

45-Which of the following is **incorrect** regarding the process of protein synthesis in eukaryotes?

A-by using the codon table, the codon GCU specifies the amino acid alanine in the genetic code of all living organisms

B- In the transcription, a part of one of the two DNA strands is used to transcribe tRNA

C- The translation can begin even before transcription has finished

D- transcription takes place in the nucleus.

46-According to the adjacent codon table, if this DNA sequence (CTCAAGTGCTTC) complements the strand that serves as a template to make mRNA, which of the following polypeptides is produced?

A- Leucine – Tyrosine – Arginine – Phenylalanine

B- Valine – Aspartic Acid – Proline – Histidine

C- Leucine – Lysine – Cysteine – Phenylalanine

D- Proline – Glutamic Acid – Leucine – valine

Codon	s in mRNA				
First bas	e	Secon	d base		Third base
	U	С	Α	G	
U	Phenylalanine Phenylalanine Leucine Leucine	Serine Serine Serine Serine	Tyrosine Tyrosine Stop Stop	Cysteine Cysteine Stop Tryptophan	U C A G
С	Leucine Leucine Leucine Leucine	Proline Proline Proline Proline	Histidine Histidine Glutamine Glutamine	Arginine Arginine Arginine Arginine	U C A G
Α	Isoleucine Isoleucine Isoleucine Methionine (star	Threonine Threonine Threonine t) Threonine	Asparagine Asparagine Lysine Lysine	Serine Serine Arginine Arginine	U C A G
G	Valine Valine Valine Valine	Alanine Alanine Alanine Alanine	Aspartic acid Aspartic acid Glutamic acid Glutamic acid	Glycine Glycine Glycine Glycine	U C A G

47-At which step of translation does the last tRNA leave the ribosome?

A- elongation

B- initiation

C- termination

D- disassembly

48-In a monohybrid cross, if half of the resulting offspring show the dominant trait, the genotype of the parents: -

A- both are heterozygous. **B-** one is heterozygous and the other is homozygous dominant

C- one is heterozygous and the other is recessive.

D- both are homozygous

49-In the 28-day period of the ovarian and menstrual cycles, which of the following occurs one after the other (in sequence)? (1- Secretion of follicle-stimulating hormone, 2- Formation of corpus luteum, 3- Growth and development of the follicle, 4- Ovulation, 5- The sharp rise in the concentration of luteinizing hormone)

B- 1	> 3	> 5	>> 4	2
D- 1	3	2	5	4

50-The promoter differs from the start codon in that the promoter: -

A- is a specific nucleotide sequence of DNA.

B- DNA polymerase binds to it

C- indicates where translation should begin

D- both (A and B) are correct

Kurdistan Region Government- Irag

In the Name of Allah

Ministry of Education-High Committee of General Examinations General exams for preparatory stage (Scientific) For the academic year (2024-2025) Second Sitting

Subject: BIOLOGY Time: 3.30 hours 12th Grade



Note: choose the correct answer: - (2 marks for each right answer)

1-The adjacent figure shows a part of the neuron axon, which of the following is correct regarding the movement of ions in their specific places on the figure across the neuron axon membrane?

_	
	The movement of ions in their specific places on the figure across the neuron axon membrane
Α	Sodium and potassium ions exit from the nerve cell
В	Sodium and potassium ions enter the nerve cell
С	Sodium ions exit from the nerve cell and potassium ions enter the nerve cell
D	Sodium ions enter the nerve cell and potassium ions exit from the nerve cell

Action potential direction Na

D-temperature response

2-Which of the following defenses targets a specific type of pathogen?

A-mucous membranes **B-**inflammatory response **C-**specific defenses

3-Which of the following secretes testosterone? **B-** seminal vesicles

C- prostate gland

D- All of them are incorrect

4-Which of the following secretes estrogen?

A- testis

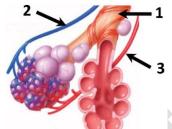
A- the mature egg **B-** corpus luteum

C- growing umbilical cord

D- All of them are correct

5-Based on the adjacent figure, choose the correct answer from the following table: -

	The blood in the blood vessel that is labeled by number 2: -	The blood in the blood vessel that is labeled by number 3: -	During exhalation the air in the structure that is labeled by number 1 passes into the: -
Α	comes from the right ventricle	returns to the left atrium	alveoli
В	returns to the left atrium	comes from the right ventricle	bronchus
С	comes from the right ventricle	returns to the left atrium	bronchus
D	returns to the right ventricle	comes from the left atrium	alveoli



6-The receptors that have tiny particles of calcium carbonate on top of them, are known as:-

A- mechanoreceptors. **B-** pain receptors. **C-** chemoreceptors.

D- photoreceptors

7-vesicles fuse with the presynaptic membrane when?

A- neurotransmitters are broken down by enzymes.

B- an action potential reaches the axon terminal of the presynaptic neuron

C- neurotransmitters are reabsorbed by a postsynaptic cell. **D-** the sodium-potassium pump is activated

8-All of the following are bones of the appendicular skeleton, **EXCEPT**: -

B- sternum A- clavicle

C- fibula

D- scapula

9-Antibodies bind to pathogens stopping their activity and destroying them: -

A- Indirectly by the specific defenses **B-** by preventing them from entering a cell, thereby blocking its reproduction.

C- by creating holes in the membranes of pathogen infected cells **D-** All of them are correct

10-Rods differ from cones in that, rods: - **A**-are stimulated by bright light **B**- contain rhodopsin. **C-** initiate the production of sharp colors. **D-** respond to different colors

11-The adjacent table shows the results of mixing several blood samples, which result in the following table is corre

ect?		Sample 1 (Donor)	Sample 2 (Recipient)	The result (the slide shape
	Α	A -	A ⁺	
	С	0-	AB ⁺	

	Sample 1 (Donor)	Sample 2 (Recipient)	The result (the slide shape)		
В	AB ⁻	O+			
D	B-	AB⁻			

12-All of the	following is	correct	regarding	the nivot	i∩int	FXCFPT -
12 All 01 th	Tollowing is	COLLOCE	regarding	ιπο ρινοι	jonit,	<u>LXOLI I</u> .

A- it is a type of a movable joint.

B- it allows the body to bend and twist.

C- it is found in the vertebral column.

D- it is found in the axial skeleton

13-Which of the following blood vessels contains (transports) dark red blood?

A- both superior and inferior vena cava B- Pulmonary veins C- Pulmonary artery D- both (A and C) are correct

14-Which of the following always presenting new antigens? **A-** rhinoviruses **B-** flu viruses

15-Which of the following is correct regarding the diastole phase?

A- The direction of blood movement is from the atria to the ventricles.

B- It is represented by the P wave in the electrocardiograph (ECG).

C- It takes longer than the atrial contraction phase. **D-** Blood flows to fill the ventricles

16-Which part of the cerebrum interprets touch information? **A-** cerebral cortex **B-** diencephalon. **C-** midbrain. **D-** the part of the cerebrum that lies beneath the surface of the cerebral cortex

17-In which of the following states the adrenaline is released? **A-**low blood glucose concentration **B**-when a person is stressed **C**-after the threat period has passed. **D-** both (A and B) are correct

18-During the first trimester:

A- primary germ layers do not form. **B-** the four embryonic membranes are not formed

C- the mother does not feel the movement of the fetus. **D-** the heart does not start beating

19-Which of the following is **incorrect** regarding the cylinders in the structure of a long bone?

A- contains yellow bone marrow.

B- consists of lamellae.

C- it is a part of the compact bone. **D-** In the center of each cylinder there is a Haversian canal

20-All of the following groups have a hormone that the site of secretion does not belong to them, **EXCEPT**: -

A- insulin, prostaglandin, glucagon. **B-** oxytocin, epinephrine, antidiuretic hormone **C-** aldosterone, cortisol, glucagon

D- thyroid stimulating hormone, adrenocorticotropic hormone, follicle-stimulating hormone

21-The smooth muscle:

A- is found in the female reproductive tract.

B- is arranged in opposing pairs.

C- its muscle fibers are not surrounded by connective tissue. **D-** has both origin and insertion points

A- skeletal muscle movement

D- All of them are correct

22-The motor division of the peripheral nervous system controls: -**B-** regulating smooth muscles **C-** secretion of all of the body's hormones directly **D-** both (A and B) are correct

23-Natural killer cells differ from neutrophils in that natural killer cells: -

A- are white blood cells.

B- contribute to general defenses. **D-** Ingest pathogens

C- attack pathogen-infected cells with the pathogen.

24-The secretory cells and target cells of which of the following hormones are part of the same organ?

A- secretin **B-** gastrin **C-** parathyroid **D-** calcitonin

25-According on the adjacent figure that shows the endometrium, maternal portion of placenta, and the fetal portion of placenta, choose the correct answer from the following:-

A- numbers 1 and 2 point to maternal veins,

B- numbers 1 and 2 point to maternal arteries,

C- number 1 points to an umbilical vein, and number 2 points a maternal vein

D- number 1 points to a maternal vein and the number 2 points to an umbilical artery

26-According to Mendel's experiments on pea plants, which of the following represents cross-pollination? **D-** All of them are correct C-TT×TT **A-** Tt × Tt **B-** TT × tt

27-In which of the following crosses, the genotype ratio of homozygous and heterozygous is equal to 1:1: -

A- monohybrid cross (heterozygous × heterozygous) **B-** monohybrid cross (heterozygous × heterozygous) **C-** incomplete dominance (heterozygous × heterozygous) **D-** All of them are correct

28-All of the following secrete a fluid that reduces (decreases) friction, EXCEPT: -

A- pleura **B-** diaphragm **C-** the tissue that lines the surfaces of the knee joint **D-** pericardium

29-Which of the following is a sequence of nucleotides in the template strand of a DNA molecule that is transcribed into a codon but then its not translated?

A-TAC

B- ACT

C- ATC

D- both (B and C) are correct

Co-White blood cells are able to perform their function because: **A- they are capable of secreting blood clotting enzymes. **B- they are formed in the red bone marrow **C- they can squeeze their way through openings in the walls of blood vessels into the intercellular fluid. **D- their nucleus and organelles disappear **1-All of the following occur in the fallopian tube, **EXCEPT: -*A- formation of morula **B- formation of zygote **C- meiosis II of the egg **D- formation of first polar body **2-The tissue that forms the outer layer of blood vessels in that the tissue that forms the outer layer of blood vessels -*A- its cells are characterized by cells that are embedded in large amounts of an intercellular substance
B- is a connective tissue C- is an epithelial tissue D- both (A and B) are correct 3- is a molecule that initiates changes inside a cell in response to the binding of a specific substance to a receptor on the outside (surface) of a cell?
A- first messenger. B- receptor protein. C- second messenger. D- hormone-receptor complex [4-In which principle of Koch's postulates principles, the pathogen is grown in the laboratory? A-1 and 3. B-2 and 4 C-1 and 2. D-3 and 4. 5-In an addict person after removing cocaine from the synapse and dopamine release returns to normal,
the postsynaptic neuron: - A- is overstimulated B- is under stimulated C- the number of receptor proteins on the postsynaptic cell decreases. D- both (B and C) are correct A- able to express itself only in the homozygous state B- able to express itself only in the heterozygous state
C- able to mask the effect of the other allele (factor) in the heterozygous state D- blending of two alleles occurs in the heterozygous state 7-Skeletal muscles: A- are not attached to the periosteum. B- are directly attached to the periosteum. B- heth (P- and C) are a great to the periosteum.
C- are attached to the periosteum by a tendon. D- both (B and C) are correct 8-Which of the following is correct regarding the secondary immune response when a person is infected with the same pathogen for the second time? A- protects the person from infecting with a new pathogen. B- memory cells are produced for the first time. C- memory cells immediately recognize it and begin to divide rapidly. D- both (B and C) are correct.
C- memory cells immediately recognize it and begin to divide rapidly P- both (B and C) are correct P-Which of the following is correct regarding the vas deference? A- it loops around the urethra. B- each normal male person has two C- transports semen to the urethra. D- all of them are correct
 O-The two adjacent figures represent the results of the Hershey and Chase experiments, in which experiment they used ³⁵S and in which experiment they used ³²P? A- In the first experiment they used ³⁵S, in the second experiment they used ³²P
B- in the first experiment they used ³² P, in the second experiment they used ³⁵ S C- in both experiments they used ³⁵ P Experiment 1 Experiment 2
 1-Which of the following is incorrect regarding the process of protein synthesis in eukaryotes? A-by using the codon table, the codon GCU specifies the amino acid alanine in the genetic code of all living organisms B- In the transcription, a part of one of the two DNA strands is used to transcribe tRNA
C- The translation can begin even before transcription has finished D- transcription takes place in the nucleus.

- **42-**According to the adjacent codon table, if this DNA sequence (CTCAAGTGCTTC) complements the strand that serves as a template to make mRNA, which of the following polypeptides is produced?
- **A-** Leucine Tyrosine Arginine Phenylalanine
- **B-** Valine Aspartic Acid Proline Histidine
- **C-** Leucine Lysine Cysteine Phenylalanine
- **D-** Proline Glutamic Acid Leucine valine

First	base		Second	d base		Third base
		U	С	Α	G	
ι	J	Phenylalanine Phenylalanine Leucine Leucine	Serine Serine Serine Serine	Tyrosine Tyrosine Stop Stop	Cysteine Cysteine Stop Tryptophan	U C A G
(Э	Leucine Leucine Leucine Leucine	Proline Proline Proline Proline	Histidine Histidine Glutamine Glutamine	Arginine Arginine Arginine Arginine	U C A G
-	4	Isoleucine Isoleucine Isoleucine Methionine (start)	Threonine Threonine Threonine Threonine	Asparagine Asparagine Lysine Lysine	Serine Serine Arginine Arginine	UCAG
(ŝ	Valine Valine Valine Valine	Alanine Alanine Alanine Alanine	Aspartic acid Aspartic acid Glutamic acid Glutamic acid	Glycine Glycine Glycine Glycine	U C A G

- **43-**In a dihybrid cross between two pea plants, one has short stem and axial flowers and the other is unknown for both traits, these ratios produced (1 short stem plant and axial flowers: 1 short stem plant and terminal flowers), which of the following represents the phenotype of the unknown plant:-
- **A-** short stem and terminal flowers
- **B-** tall stem and terminal flowers

C- short stem and axial flowers

- **D-**tall stem and axial flowers
- **44-**In the 28-day period of the ovarian and menstrual cycles, which of the following occurs one after the other (in sequence)? (1- Secretion of follicle-stimulating hormone, 2- Formation of corpus luteum, 3- Growth and development of the follicle, 4- Ovulation, 5- The sharp rise in the concentration of luteinizing hormone)

A- 2	1	3	5 5	> 4	B- 1	3	5	4	2
C- 3	1	2	5	4	D- 1	3	> 2	5	> 4

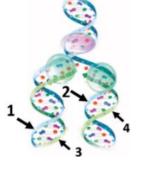
- **45**-Which of the following is correct regarding the structure of a DNA molecule?
- 1.the number of sugar molecules is equal to the number of the phosphate group molecules.
- 2. each nucleotide can differ from another nucleotide only in the type of nitrogenous base.
- 3.the nitrogenous base is connected to the phosphate group directly by a covalent bond.
- **C-** 2. 3 **A-**1, 2. **B-** 1. 3
- **46-**Test cross determines the genotype of any individual who expresses the: -
 - **A-** dominant phenotype.

B- recessive phenotype

D- 1, 2, 3

- **C-** dominant phenotype and recessive phenotype
- **D-** intermediate phenotype
- **47-**At which step of translation does the last tRNA leave the ribosome?
- **A-** elongation
- **B-** initiation
- **C-** termination
- **D-** disassembly
- **48-**In a monohybrid cross, if half of the resulting offspring show the dominant trait, the genotype of the parents: -
- **A-** both are heterozygous. **B-** one is heterozygous and the other is homozygous dominant
- **C-** one is heterozygous and the other is recessive.
- **D-** both are homozygous
- **49-**The promoter differs from the start codon in that the promoter: -
- **A-** is a specific nucleotide sequence of DNA.
- **B-** DNA polymerase binds to it
- **C-** indicates where translation should begin
- **D-** both (A and B) are correct
- **50-** According to the adjacent figure that shows the process of DNA replication, after completing this process, which of the choices in the following table is correct regarding the ratio of pyrimidines and the ratio of purines?

	The ratio of pyrimidines in theis equal to the ratio of purines in the	The ratio of pyrimidines in theis <u>NOT EQUAL</u> to the ratio of purines in the
Α	Strand 2 , strand 4	Strand 1 , strand 3
В	Strand 1 , strand 4	Strand 2 , strand 4
С	Strand 2 , strand 3	Strand 3 , strand 4
D	Strand 1 , strand 3	Strand 2 , strand 3



Subject: BIOLOGY Time: 3.30 hours 12th Grade



Note: choose the correct answer: - (2 marks for each right answer)

1-Which of the following defenses targets a specific type of pathogen?

A-mucous membranes **B-**inflammatory response **C-**specific defenses **D-**temperature response

2-The smooth muscle:

A- is found in the female reproductive tract.

B- is arranged in opposing pairs.

C- its muscle fibers are not surrounded by connective tissue. **D-** has both origin and insertion points

3-According to Mendel's experiments on pea plants, which of the following represents cross-pollination? **B-** TT × tt C-TT×TT **D-** All of them are correct

 $A-Tt \times Tt$

4-Skeletal muscles:

A- are not attached to the periosteum.

B- are directly attached to the periosteum. **D-** both (B and C) are correct

C- are attached to the periosteum by a tendon.

5-vesicles fuse with the presynaptic membrane when?

A- neurotransmitters are broken down by enzymes.

B- an action potential reaches the axon terminal of the presynaptic neuron

C- neurotransmitters are reabsorbed by a postsynaptic cell. **D-** the sodium-potassium pump is activated

6-All of the following are bones of the appendicular skeleton. **EXCEPT**: -

B-2 and 4

A- clavicle **B-** sternum

7-In which principle of Koch's postulates principles, the pathogen is grown in the laboratory?

C- fibula

A-1 and 3.

C-1 and 2. **D-**3 and 4.

8-Which of the following is correct regarding the secondary immune response when a person is infected with the same pathogen for the second time?

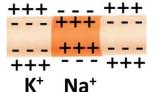
A- protects the person from infecting with a new pathogen. **B-** memory cells are produced for the first time. **C-** memory cells immediately recognize it and begin to divide rapidly **D-** both (B and C) are correct

9-The receptors that have tiny particles of calcium carbonate on top of them, are known as:-**A-** mechanoreceptors. **B-** pain receptors. **C-** chemoreceptors. **D-** photoreceptors

10-The adjacent figure shows a part of the neuron axon, which of the following is correct regarding the movement of ions in their specific places on the figure across the neuron axon membrane?

	The movement of ions in their specific places on the figure across the neuron axon membrane
Α	Sodium and potassium ions exit from the nerve cell
В	Sodium and potassium ions enter the nerve cell
С	Sodium ions exit from the nerve cell and potassium ions enter the nerve cell
D	Sodium ions enter the nerve cell and potassium ions exit from the nerve cell

Action potential direction



11-Which of the following is correct regarding the vas deference?

A- it loops around the urethra.

B- each normal male person has two

C- transports semen to the urethra.

D- all of them are correct

12-Which of the following is correct regarding the diastole phase?

A- The direction of blood movement is from the atria to the ventricles.

B- It is represented by the P wave in the electrocardiograph (ECG).

C- It takes longer than the atrial contraction phase. **D-** Blood flows to fill the ventricles

13-Which of the following always presenting new antigens?

A- rhinoviruses

B- flu viruses

D- All of them are correct

14-The adjacent table shows the results of mixing several blood samples, which result in the following table is correct?

Sample 1 Sample 2 The result (Donor) (Recipient) (the slide shape) A^{-} A+ AB+ C O-

		Sample 2 (Recipient)	The result (the slide shape)
В	AB ⁻	O+	
D	B ⁻	AB ⁻	

15-.....is a molecule that initiates changes inside a cell in response to the binding of a specific substance to a receptor on the outside (surface) of a cell?

A- first messenger. **B-** receptor protein.

C- second messenger. **D-** hormone-receptor complex

B- diencephalon.

16-Which part of the cerebrum interprets touch information? **A-** cerebral cortex **C-** midbrain. **D-** the part of the cerebrum that lies beneath the surface of the cerebral cortex

17-In an addict person after removing cocaine from the synapse and dopamine release returns to normal, the postsynaptic neuron: -**A-** is overstimulated **B-** is under stimulated

C- the number of receptor proteins on the postsynaptic cell decreases.

D- both (B and C) are correct

18-Antibodies bind to pathogens stopping their activity and destroying them: -

A- Indirectly by the specific defenses **B-** by preventing them from entering a cell, thereby blocking its reproduction.

C- by creating holes in the membranes of pathogen infected cells **D-** All of them are correct

19-The secretory cells and target cells of which of the following hormones are part of the same organ? **B-** gastrin

A- secretin

C- parathyroid

D- calcitonin

20-Natural killer cells differ from neutrophils in that natural killer cells: -

A- are white blood cells.

B- contribute to general defenses.

C- attack pathogen-infected cells with the pathogen.

D- Ingest pathogens

21-All of the following groups have a hormone that the site of secretion does not belong to them. **EXCEPT**: -

A- insulin, prostaglandin, glucagon. **B-** oxytocin, epinephrine, antidiuretic hormone **C-** aldosterone, cortisol, glucagon **D-** thyroid stimulating hormone, adrenocorticotropic hormone, follicle-stimulating hormone

22-Which of the following is **incorrect** regarding the cylinders in the structure of a long bone?

A- contains yellow bone marrow.

B- consists of lamellae.

C- it is a part of the compact bone.

D- In the center of each cylinder there is a Haversian canal **23-**The tissue that forms the outer layer of blood vessels differs from the tissue that forms the inner layer of

blood vessels in that the tissue that forms the outer layer of blood vessels -

A- its cells are characterized by cells that are embedded in large amounts of an intercellular substance

B- is a connective tissue

C- is an epithelial tissue **24-**In which of the following states the adrenaline is released?

D- both (A and B) are correct **A-**low blood glucose concentration

B-when a person is stressed **C-**after the threat period has passed.

D- both (A and B) are correct

D- pericardium

25-All of the following secrete a fluid that reduces (decreases) friction, EXCEPT: -A- pleura B- diaphragm C- the tissue that lines the surfaces of the knee joint

26-All of the following is correct regarding the pivot joint, **EXCEPT**: -

A- it is a type of a movable joint.

B- it allows the body to bend and twist.

C- it is found in the vertebral column.

D- it is found in the axial skeleton

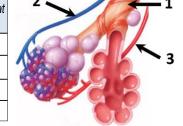
27-All of the following occur in the fallopian tube. **EXCEPT**: -

A- formation of morula

B- formation of zygote **C-** meiosis *II* of the egg **D-** formation of first polar body

28-Based on the adjacent figure, choose the correct answer from the following table: -

		The blood in the blood vessel that is labeled by number 2: -	The blood in the blood vessel that is labeled by number 3: -	During exhalation the air in the structure that is labeled by number 1 passes into the: -	
-	Α	comes from the right ventricle	returns to the left atrium	alveoli	
	В	returns to the left atrium	comes from the right ventricle	bronchus	•
	С	comes from the right ventricle	returns to the left atrium	bronchus	
١	D	returns to the right ventricle	comes from the left atrium	alveoli	



0019

29-According on the adjacent figure that shows the endometrium, maternal portion of placenta, and the fetal portion of placenta, choose the correct answer from the following:- A- numbers 1 and 2 point to maternal veins, B- numbers 1 and 2 point to maternal arteries, C- number 1 points to an umbilical vein, and number 2 points a maternal vein D- number 1 points to a maternal vein and the number 2 points to an umbilical artery 30-In which of the following crosses, the genotype ratio of homozygous and heterozygous is equal to 1:1: - A- monohybrid cross (heterozygous × heterozygous) B- monohybrid cross (heterozygous × heterozygous)					
C- incomplete dominance (heterozygous × heterozygous) D- All of them are correct					
31- Which of the following secretes estrogen? A- the mature egg B- corpus luteum C	C- growing umbilical cord D- All of them are correct				
32- In Mendelian genetics, an allele (factor) is cons					
	state B- able to express itself only in the heterozygous state or) in the heterozygous state				
33-Which of the following is a sequence of nucl	leotides in the template strand of a DNA molecule that is				
transcribed into a codon but then its not translated A- TAC B- ACT C- ATC					
A-TAC B- ACT C- ATC 34-Which of the following blood vessels contains (t	D- both (B and C) are correct transports) dark red blood?				
	onary veins C- Pulmonary artery D- both (A and C) are correct				
	e stimulated by bright light B- contain rhodopsin.				
36- During the first trimester:	e production of sharp colors. D- respond to different colors				
A- primary germ layers do not form. B- the four C- the mother does not feel the movement of the					
A- they are capable of secreting blood clotting	 37-White blood cells are able to perform their function because: A- they are capable of secreting blood clotting enzymes. B- they are formed in the red bone marrow C- they can squeeze their way through openings in the walls of blood vessels into the intercellular fluid. 				
38 -Which of the following secretes testosterone?					
,	state gland				
	of the body's hormones directly D- both (A and B) are correct				
40- The two adjacent figures represent the results of	of the Hershey and Chase experiments,				
in which experiment they used ³⁵ S and in which e	experiment they used ³² P?				
A- In the first experiment they used ³⁵ S, in the second experiment they used ³² P					
B- in the first experiment they used ³² P, in the second experiment they used ³⁵ S					
C- in both experiments they used ³⁵ S					
D- in both experiments they used ³² P	Experiment 1 Experiment 2				
41- Test cross determines the genotype of any i	individual who expresses the: -				
A- dominant phenotype.	B- recessive phenotype				
C- dominant phenotype and recessive phenotype D- intermediate phenotype					
42- According to the adjacent figure that shows the p completing this process, which of the choices in the regarding the ratio of pyrimidines and the ratio of pu	following table is correct				
The ratio of pyrimidines in theis equal to the ratio of					
purines in the A Strand 2 , strand 4	ratio of purines in the Strand 1 , strand 3				
B Strand 1 , strand 4	Strand 2 , strand 4				
C Strand 2 , strand 3	Strand 3 , strand 4				

43-In a monohybrid cross, if half of the resulting offspring show the dominant trait, the genotype of the parents: -

A- both are heterozygous. **B-** one is heterozygous and the other is homozygous dominant

C- one is heterozygous and the other is recessive. **D-** both are homozygous

44-In a dihybrid cross between two pea plants, one has short stem and axial flowers and the other is unknown for both traits, these ratios produced (1 short stem plant and axial flowers: 1 short stem plant and terminal flowers), which of the following represents the phenotype of the unknown plant:-

A- short stem and terminal flowers

B- tall stem and terminal flowers

C- short stem and axial flowers

D-tall stem and axial flowers

45-The promoter differs from the start codon in that the promoter: -

A- is a specific nucleotide sequence of DNA.

B- DNA polymerase binds to it

C- indicates where translation should begin

D- both (A and B) are correct

46-At which step of translation does the last tRNA leave the ribosome?

A- elongation

B- initiation

C- termination

D- disassembly

47-According to the adjacent codon table, if this DNA sequence (CTCAAGTGCTTC) complements the strand that serves as a template to make mRNA, which of the following polypeptides is produced?

A- Leucine – Tyrosine – Arginine – Phenylalanine

B- Valine – Aspartic Acid – Proline – Histidine

C- Leucine – Lysine – Cysteine – Phenylalanine

D- Proline – Glutamic Acid – Leucine – valine

First bas	е	Secon	d base		Third base
	U	С	A	G	
U	Phenylalanine Phenylalanine Leucine Leucine	Serine Serine Serine Serine	Tyrosine Tyrosine Stop Stop	Cysteine Cysteine Stop Tryptophan	UCAG
С	Leucine	Proline	Histidine	Arginine	U
	Leucine	Proline	Histidine	Arginine	C
	Leucine	Proline	Glutamine	Arginine	A
	Leucine	Proline	Glutamine	Arginine	G
Α	Isoleucine	Threonine	Asparagine	Serine	U
	Isoleucine	Threonine	Asparagine	Serine	C
	Isoleucine	Threonine	Lysine	Arginine	A
	Methionine (start)	Threonine	Lysine	Arginine	G
G	Valine	Alanine	Aspartic acid	Glycine	U
	Valine	Alanine	Aspartic acid	Glycine	C
	Valine	Alanine	Glutamic acid	Glycine	A
	Valine	Alanine	Glutamic acid	Glycine	G

48-Which of the following is correct regarding the structure of a DNA molecule?

1.the number of sugar molecules is equal to the number of the phosphate group molecules.

2. each nucleotide can differ from another nucleotide only in the type of nitrogenous base.

3.the nitrogenous base is connected to the phosphate group directly by a covalent bond.

A-1. 2.

B- 1. 3

C- 2. 3

D- 1. 2. 3

49-Which of the following is **incorrect** regarding the process of protein synthesis in eukaryotes?

A-by using the codon table, the codon GCU specifies the amino acid alanine in the genetic code of all living organisms

B- In the transcription, a part of one of the two DNA strands is used to transcribe tRNA

C- The translation can begin even before transcription has finished **D-** transcription takes place in the nucleus.

50-In the 28-day period of the ovarian and menstrual cycles, which of the following occurs one after the other (in sequence)? (1- Secretion of follicle-stimulating hormone, 2- Formation of corpus luteum, 3- Growth and development of the follicle, 4- Ovulation, 5- The sharp rise in the concentration of luteinizing hormone)

A-2 1 3 5 4

B-1 > 3 > 5 > 4 > 2

C-3 1 2 5 4

D-1 3 2 5 4

Subject: BIOLOGY Time: 3.30 hours 12th Grade



Note: choose the correct answer: - (2 marks for each right answer)

1-All of the following secrete a fluid that reduces(decreases) friction, **EXCEPT**: -

A- pleura **B-** diaphragm **C-** the tissue that lines the surfaces of the knee joint **D-** pericardium

2-Natural killer cells differ from neutrophils in that natural killer cells: -

A- are white blood cells.

C- attack pathogen-infected cells with the pathogen.

B- contribute to general defenses.

D- Ingest pathogens

3-The tissue that forms the outer laver of blood vessels differs from the tissue that forms the inner laver of blood vessels in that the tissue that forms the outer layer of blood vessels -

A- its cells are characterized by cells that are embedded in large amounts of an intercellular substance

B- is a connective tissue

C- is an epithelial tissue

D- both (A and B) are correct **A-** skeletal muscle movement

4-The motor division of the peripheral nervous system controls: -**B-** regulating smooth muscles **C-** secretion of all of the body's hormones directly **D-** both (A and B) are correct

5-According on the adjacent figure that shows the endometrium, maternal portion of placenta. and the fetal portion of placenta, choose the correct answer from the following:-

A- numbers 1 and 2 point to maternal veins,

B- numbers 1 and 2 point to maternal arteries,

C- number 1 points to an umbilical vein, and number 2 points a maternal vein

D- number 1 points to a maternal vein and the number 2 points to an umbilical artery

6-In which principle of Koch's postulates principles, the pathogen is grown in the laboratory?

A-1 and 3.

B-2 and 4

C-1 and 2.

D-3 and 4.

7-The smooth muscle:

A- is found in the female reproductive tract.

B- is arranged in opposing pairs.

C- its muscle fibers are not surrounded by connective tissue. **D-** has both origin and insertion points

8-All of the following groups have a hormone that the site of secretion does not belong to them, EXCEPT: -

A- insulin, prostaglandin, glucagon. **B-** oxytocin, epinephrine, antidiuretic hormone **C-** aldosterone, cortisol, glucagon

D- thyroid stimulating hormone, adrenocorticotropic hormone, follicle-stimulating hormone

9-During the first trimester:

A- primary germ layers do not form. **B-** the four embryonic membranes are not formed

C- the mother does not feel the movement of the fetus.

D- the heart does not start beating

10-The adjacent figure shows a part of the neuron axon, which of the following is correct regarding the movement of ions in their specific places on the figure across the neuron axon membrane?

	The movement of ions in their specific places on the figure across the neuron axon membrane		
Α	Sodium and potassium ions exit from the nerve cell		
В	Sodium and potassium ions enter the nerve cell		
С	Sodium ions exit from the nerve cell and potassium ions enter the nerve cell		
D	Sodium ions enter the nerve cell and potassium ions exit from the nerve cell		

Action potential direction Na⁺

11-vesicles fuse with the presynaptic membrane when?

A- neurotransmitters are broken down by enzymes.

B- an action potential reaches the axon terminal of the presynaptic neuron

C- neurotransmitters are reabsorbed by a postsynaptic cell. **D-** the sodium-potassium pump is activated

12-Which of the following defenses targets a specific type of pathogen?

A-mucous membranes **B-**inflammatory response **C-**specific defenses **D-**temperature response

13-Which of the following is **incorrect** regarding the cylinders in the structure of a long bone?

A- contains yellow bone marrow.

B- consists of lamellae.

C- it is a part of the compact bone.

D- In the center of each cylinder there is a Haversian canal

14-Rods differ from cones in that, rods: - **A-**are stimulated by bright light

C- initiate the production of sharp colors. **D-** respond to different colors

B- contain rhodopsin.

15-All of the following are bones of the appendicular skeleton, **EXCEPT**: -

C- fibula A- clavicle **B-** sternum

D- scapula

16-The receptors that have tiny particles of calcium carbonate on top of them, are known as:-**A-** mechanoreceptors. **B-** pain receptors. C- chemoreceptors. **D-** photoreceptors

17-Which of the following secretes testosterone?

B- seminal vesicles **C-** prostate gland

D- All of them are incorrect

18-The adjacent table shows the results of mixing several blood samples, which result in the following table is

correct?

A- testis

	Sample 1 (Donor)	Sample 2 (Recipient)	The result (the slide shape)
Α	A -	A ⁺	
С	0-	AB+	

	Sample 1 (Donor)	Sample 2 (Recipient)	The result (the slide shape)
В	AB ⁻	O+	
D	B-	AB ⁻	

19-Which of the following always presenting new antigens?

A- rhinoviruses

B- flu viruses

D- All of them are correct

20-Which part of the cerebrum interprets touch information? **A-** cerebral cortex **B-** diencephalon. **C-** midbrain. **D-** the part of the cerebrum that lies beneath the surface of the cerebral cortex

21-Skeletal muscles:

A- are not attached to the periosteum.

B- are directly attached to the periosteum.

C- are attached to the periosteum by a tendon.

D- both (B and C) are correct

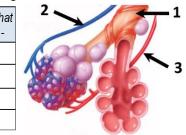
22-All of the following occur in the fallopian tube, **EXCEPT**: -

A- formation of morula **B-** formation of zygote

C- meiosis *II* of the egg **D-** formation of first polar body

23-Based on the adjacent figure, choose the correct answer from the following table: -

	The blood in the blood vessel that is labeled by number 2: -	The blood in the blood vessel that is labeled by number 3: -	During exhalation the air in the structure that is labeled by number 1 passes into the: -
Α	comes from the right ventricle	returns to the left atrium	alveoli
В	returns to the left atrium	comes from the right ventricle	bronchus
С	comes from the right ventricle	returns to the left atrium	bronchus
D	returns to the right ventricle	comes from the left atrium	alveoli



24-The secretory cells and target cells of which of the following hormones are part of the same organ?

A- secretin

B- gastrin

C- parathyroid

D- calcitonin

25-In which of the following crosses, the genotype ratio of homozygous and heterozygous is equal to 1:1: -**A-** monohybrid cross (heterozygous × heterozygous) **B-** monohybrid cross (heterozygous × heterozygous)

C- incomplete dominance (heterozygous × heterozygous) **D-** All of them are correct

26-.....is a molecule that initiates changes inside a cell in response to the binding of a specific substance to a receptor on the outside (surface) of a cell? **C-** second messenger. **D-** hormone-receptor complex

A- first messenger. **B-** receptor protein. **27-**All of the following is correct regarding the pivot joint, **EXCEPT**: -

A- it is a type of a movable joint.

B- it allows the body to bend and twist.

C- it is found in the vertebral column.

D- it is found in the axial skeleton

28-Which of the following is correct regarding the diastole phase?

A- The direction of blood movement is from the atria to the ventricles.

B- It is represented by the P wave in the electrocardiograph (ECG).

C- It takes longer than the atrial contraction phase. **D-** Blood flows to fill the ventricles **29-**In which of the following states the adrenaline is released? **A-**low blood glucose concentration

B-when a person is stressed

C-after the threat period has passed.

D- both (A and B) are correct

De According to Mondel's apprehendent on page plants, which of the following represents cross-polination? An 17: T B T 1 x C T 17: T D Aid from the control of the state of t		
De blending of two alleles occurs in the heterotyzous state 5-Which of the following is occured regarding the secondary immune response when a person is infected with the same pathogen for the second time? A protect stie person from indenting with a new pathogen. B memory cells are produced for the first time. C memory cells immediately recognize it and begin to divide rapidly D- both (B and C) are cornect. 6-Which of the following is cornect regarding the vas deference? A it loops around the urethra. B - each normal male person has two C transports semen to the urethra. B - each normal male person has two C transports semen to the urethra. B - each normal male person has two C transports semen to the urethra. B - each normal male person has two C transports semen to the urethra. B - each normal male person has two C transports semen to the urethra. B - each normal male person has two C transports semen to the urethra. B - each normal male person has two C transports semen to the urethra. B - each normal male person has two C transports semen to the urethra. B - each normal male person has two C transports semen to the urethra. D - both (B and C) are cornect A I toops around the urethra. D - both (B and C) are cornect A I teuche - Tyrosine - Arginine - Phenylalanine B - Valine - Aspatian Acid - Proline - Histidine C - Leucine - Lysine - Cysteine - Phenylalanine B - Each normal male person that the second dependence of a law of the postsynaptic purpose. A I the mature egg B - corpus luteum C - growing umbilical cord C - the mimber of receptor proteins on the postsynaptic cell decreases. D - both (B and C) are cornect C - the unimber of receptor proteins on the postsynaptic cell decreases. D - both (B and C) are cornect A - the mature egg B - corpus luteum C - termination D - disassembly The number of sugar molecules is equal to the number of the phosphate group molecules is equal to the number of the phosphate group directly by a covalent bond. A - 1, 2 B - 1, 3 C - 2, 3 D - 1, 2, 3 B	A- Tt × Tt B- TT × tt C- TT × TT D- All of them are correct 1-Antibodies bind to pathogens stopping their activity and destroying them: - A- Indirectly by the specific defenses B- by preventing them from entering a cell, thereby blocking its reproduction. C- by creating holes in the membranes of pathogen infected cells D- All of them are correct 2-Which of the following blood vessels contains (transports) dark red blood? A- both superior and inferior vena cava B- Pulmonary veins C- Pulmonary artery D- both (A and C) are correct 3-White blood cells are able to perform their function because: A- they are capable of secreting blood clotting enzymes. B- they are formed in the red bone marrow C- they can squeeze their way through openings in the walls of blood vessels into the intercellular fluid. D- their nucleus and organelles disappear 4-In Mendelian genetics, an allele (factor) is considered as a dominant if: A- able to express itself only in the homozygous state B- able to express itself only in the heterozygous state	(in sequence)? (1- Secretion of follicle-stimulating hormone, 2- Formation of corpus luteum, 3- Growth and development of the follicle, 4- Ovulation, 5- The sharp rise in the concentration of luteinizing hormone) A-2 1 3 5 4 B-1 3 5 4 2 C-3 1 2 5 4 D-1 3 2 5 4 44- According to the adjacent figure that shows the process of DNA replication, after completing this process, which of the choices in the following table is correct regarding the ratio of pyrimidines and the ratio of purines? The ratio of pyrimidines in theis equal to the ratio of purines in the Strand 2 , strand 4 Strand 3
C- The translation can begin even before transcription has finished D- transcription takes place in the nucleus.	5-Which of the following is correct regarding the secondary immune response when a person is infected with the same pathogen for the second time? A- protects the person from infecting with a new pathogen. B- memory cells are produced for the first time. C- memory cells immediately recognize it and begin to divide rapidly D- both (B and C) are correct 6-Which of the following is correct regarding the vas deference? A- it loops around the urethra. B- each normal male person has two C- transports semen to the urethra. D- all of them are correct 7-Which of the following is a sequence of nucleotides in the template strand of a DNA molecule that is transcribed into a codon but then its not translated? A-TAC B-ACT C-ATC D- both (B and C) are correct 8-Which of the following secretes estrogen? A- the mature egg B- corpus luteum C- growing umbilical cord D- All of them are correct 9-In an addict person after removing cocaine from the synapse and dopamine release returns to normal, the postsynaptic neuron: - A- is overstimulated B- is under stimulated C- the number of receptor proteins on the postsynaptic cell decreases. D- both (B and C) are correct 0-The two adjacent figures represent the results of the Hershey and Chase experiments, in which experiment they used 35S and in which experiment they used 32P? A- In the first experiment they used 35S and in which experiment they used 32P? A- In the first experiments they used 35S. D- in both experiments they used 35S. D- in both experiments they used 35S. D- in both experiments they used 35S. B- tall stem and axial flowers and the other is unknown for both traits, these ratios produced (1 short stem plant and axial flowers), which of the following represents the phenotype of the unknown plant:- A- short stem and arial flowers D- tall stem and terminal flowers D- tall stem and terminal flowers D- tall stem and terminal in the genetic code of all living organisms B- lin the transcription, a part of one of the two DNA strands is used to transcribe tRNA	45-According to the adjacent codon table, if this DNA sequence (CTCAAGTGCTTC) complements the strand that serves as a template to make mRNA, which of the following polypeptides is produced? A-Leucine — Tyrosine — Arginine — Phenylalanine B- Valine — Aspartic Acid — Proline — Histidine C- Leucine — Lysine — Cysteine — Phenylalanine D- Proline — Glutamic Acid — Leucine — valine 46-At which step of translation does the last tRNA leave the ribosome? A- elongation B- initiation C- termination D- disassembly 47-Which of the following is correct regarding the structure of a DNA molecule? 1.the number of sugar molecules is equal to the number of the phosphate group molecules. 2. each nucleotide can differ from another nucleotide only in the type of nitrogenous base. 3.the nitrogenous base is connected to the phosphate group directly by a covalent bond. A-1, 2. B-1, 3 C-2, 3 D-1, 2, 3 48-Test cross determines the genotype of any individual who expresses the: - A- dominant phenotype. C- dominant phenotype. C- dominant phenotype. C- dominant phenotype and recessive phenotype D- intermediate phenotype 49-In a monohybrid cross, if half of the resulting offspring show the dominant trait, the genotype of the parents: - A- both are heterozygous. B- one is heterozygous and the other is homozygous 50-The promoter differs from the start codon in that the promoter: - A- is a specific nucleotide sequence of DNA. B- DNA polymerase binds to it

Subject: BIOLOGY Time: 3.30 hours 12th Grade



Note: choose the correct answer: - (2 marks for each right answer)

1-All of the following secrete a fluid that reduces(decreases) friction, **EXCEPT**: -

B- diaphragm **C-** the tissue that lines the surfaces of the knee joint **D-** pericardium **A-** pleura

2-Which of the following secretes testosterone?

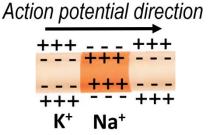
B- seminal vesicles **C-** prostate gland A- testis **D-** All of them are incorrect

3-Which of the following is correct regarding the secondary immune response when a person is infected with the same pathogen for the second time?

A- protects the person from infecting with a new pathogen. **B-** memory cells are produced for the first time. **C-** memory cells immediately recognize it and begin to divide rapidly **D-** both (B and C) are correct

4-The adjacent figure shows a part of the neuron axon, which of the following is correct regarding the movement of ions in their specific places on the figure across the neuron axon membrane?

	The movement of ions in their specific places on the figure across the neuron axon membrane		
Α	Sodium and potassium ions exit from the nerve cell		
В	Sodium and potassium ions enter the nerve cell		
С	Sodium ions exit from the nerve cell and potassium ions enter the nerve cell		
D	Sodium ions enter the nerve cell and potassium ions exit from the nerve cell		



5-All of the following occur in the fallopian tube, **EXCEPT**: -

A- formation of morula **B-** formation of zygote **C-** meiosis II of the egg **D-** formation of first polar body

6-Which of the following is correct regarding the diastole phase?

A- The direction of blood movement is from the atria to the ventricles.

B- It is represented by the P wave in the electrocardiograph (ECG).

C- It takes longer than the atrial contraction phase. **D-** Blood flows to fill the ventricles

7-In which principle of Koch's postulates principles, the pathogen is grown in the laboratory?

A-1 and 3.

B-2 and 4 **C-**1 and 2. **D-**3 and 4.

8-Which part of the cerebrum interprets touch information? **A-** cerebral cortex **B-** diencephalon. **C-** midbrain. **D-** the part of the cerebrum that lies beneath the surface of the cerebral cortex

9-Which of the following is a sequence of nucleotides in the template strand of a DNA molecule that is transcribed into a codon but then its not translated?

A-TAC

B- ACT

C- ATC

D- both (B and C) are correct

10-In which of the following crosses, the genotype ratio of homozygous and heterozygous is equal to 1:1: -

A- monohybrid cross (heterozygous × heterozygous) B- monohybrid cross (heterozygous × heterozygous)

C- incomplete dominance (heterozygous × heterozygous) **D-** All of them are correct

11-Which of the following blood vessels contains (transports) dark red blood?

A- both superior and inferior vena cava B- Pulmonary veins C- Pulmonary artery D- both (A and C) are correct

12-In an addict person after removing cocaine from the synapse and dopamine release returns to normal, the postsynaptic neuron: -**A-** is overstimulated **B-** is under stimulated

C- the number of receptor proteins on the postsynaptic cell decreases.

D- both (B and C) are correct

13-Rods differ from cones in that, rods: - **A**-are stimulated by bright light **B**- contain rhodopsin.

C- initiate the production of sharp colors. **D-** respond to different colors

14-In Mendelian genetics, an allele (factor) is considered as a dominant if:

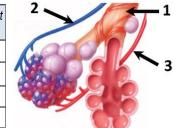
A- able to express itself only in the homozygous state **B-** able to express itself only in the heterozygous state

C- able to mask the effect of the other allele (factor) in the heterozygous state

D- blending of two alleles occurs in the heterozygous state

15-Based on the adjacent figure, choose the correct answer from the following table: -

	The blood in the blood vessel that is labeled by number 2: -	The blood in the blood vessel that is labeled by number 3: -	During exhalation the air in the structure that is labeled by number 1 passes into the: -
Α	comes from the right ventricle	returns to the left atrium	alveoli
В	returns to the left atrium	comes from the right ventricle	bronchus
С	comes from the right ventricle	returns to the left atrium	bronchus
D	returns to the right ventricle	comes from the left atrium	alveoli



16-Which of the following defenses targets a specific type of pathogen?

A-mucous membranes **B-**inflammatory response **C-**specific defenses **D-**temperature response

17-The motor division of the peripheral nervous system controls: -A- skeletal muscle movement

B- regulating smooth muscles **C-** secretion of all of the body's hormones directly **D-** both (A and B) are correct

18-According to Mendel's experiments on pea plants, which of the following represents cross-pollination? **B-** TT × tt C-TT×TT **D-** All of them are correct **A-** Tt × Tt

19-Which of the following always presenting new antigens?

A- rhinoviruses **B-** flu viruses

D- All of them are correct **20-**The secretory cells and target cells of which of the following hormones are part of the same organ? **D-** calcitonin

A- secretin **B-** gastrin **C-** parathyroid **21-**Which of the following is correct regarding the vas deference?

A- it loops around the urethra.

B- each normal male person has two

C- transports semen to the urethra.

D- all of them are correct

22-vesicles fuse with the presynaptic membrane when?

A- neurotransmitters are broken down by enzymes.

B- an action potential reaches the axon terminal of the presynaptic neuron

C- neurotran'smitters are reabsorbed by a postsynaptic cell. **D-** the sodium-potassium pump is activated

23-According on the adjacent figure that shows the endometrium, maternal portion of placenta, and the fetal portion of placenta, choose the correct answer from the following:-

A- numbers 1 and 2 point to maternal veins,

B- numbers 1 and 2 point to maternal arteries,

C- number 1 points to an umbilical vein, and number 2 points a maternal vein

D- number 1 points to a maternal vein and the number 2 points to an umbilical artery

24-.....is a molecule that initiates changes inside a cell in response to the binding of a specific substance to a receptor on the outside (surface) of a cell?

C- second messenger. **D-** hormone-receptor complex **A-** first messenger. **B-** receptor protein.

25-The tissue that forms the outer layer of blood vessels differs from the tissue that forms the inner layer of blood vessels in that the tissue that forms the outer layer of blood vessels -

A- its cells are characterized by cells that are embedded in large amounts of an intercellular substance

B- is a connective tissue

C- is an epithelial tissue

D- both (A and B) are correct

26-All of the following groups have a hormone that the site of secretion does not belong to them, **EXCEPT**: -

A- insulin, prostaglandin, glucagon. **B-** oxytocin, epinephrine, antidiuretic hormone C- aldosterone, cortisol, glucagon **D-** thyroid stimulating hormone, adrenocorticotropic hormone, follicle-stimulating hormone

27-White blood cells are able to perform their function because:

A- they are capable of secreting blood clotting enzymes. **B-** they are formed in the red bone marrow **C-** they can squeeze their way through openings in the walls of blood vessels into the intercellular fluid.

D- their nucleus and organelles disappear

28-In which of the following states the adrenaline is released? **A-**low blood glucose concentration **B-**when a person is stressed **C-**after the threat period has passed. **D-** both (A and B) are correct

29-Antibodies bind to pathogens stopping their activity and destroying them: -

A- Indirectly by the specific defenses **B-** by preventing them from entering a cell, thereby blocking its reproduction.

D- scapula

D- All of them are correct **C-** by creating holes in the membranes of pathogen infected cells

30-All of the following are bones of the appendicular skeleton, **EXCEPT**: -**B-** sternum **C-** fibula A- clavicle

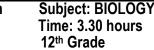
0021

1-Which of the following is incorrect regarding the cylinders in the structure of a long bone? A- contains yellow bone marrow. B- consists of lamellae. C- it is a part of the compact bone. D- In the center of each cylinder there is a Haversian canal end of the periosteum. B- are directly attached to the periosteum. C- are attached to the periosteum by a tendon. D- both (B and C) are correct B- is arranged in opposing pairs. C- its muscle fibers are not surrounded by connective tissue. D- has both origin and insertion points C- growing umbilical cord D- All of them are correct	**According to the adjacent codon table, if this DNA sequence (CTCAAGTGCTTC) complements the strand that serves as a template to make mRNA, which of the following polypeptides is produced? **A-Leucine - Tyrosine - Arginine - Phenylalanine B- Valine - Aspartic Acid - Proline - Histidine C- Leucine - Lysine - Cysteine - Phenylalanine B- Valine - Aspartic Acid - Phenylalanine B- Valine - Alanine Agaragine Lysine Arginine Arginine Arginine Arginine G- Valine Alanine Alanine Glutamic Arginine Arginine Arginine Arginine Arginine G- Valine Alanine Glutamic Arginine Arginine Arginine Arginine Arginine Arginine G- Valine Alanine Glutamic Arginine Arginine Arginine Arginine Arginine G- Valine Alanine Glutamic Arginine Argi
5- The adjacent table shows the results of mixing several blood samples, which result in the following table is correct?	44 -At which step of translation does the last tRNA leave the ribosome? A- elongation B- initiation C- termination D- disassembly
Sample 1 Sample 2 The result Sample 1 Sample 2 The result (Donor) (Recipient) (the slide shape) (Donor) (Recipient) (the slide shape)	45- In a monohybrid cross, if half of the resulting offspring show the dominant trait, the genotype of the parents: -
A A ⁻ A ⁺ B AB ⁻ O ⁺	 A- both are heterozygous. B- one is heterozygous and the other is homozygous dominant C- one is heterozygous and the other is recessive. D- both are homozygous 46-In a dihybrid cross between two pea plants, one has short stem and axial flowers and the other is unknown for both treits, those ratios produced (1 short stem plant and exial flowers).
C O- AB+ D B- AB-	both traits, these ratios produced (1 short stem plant and axial flowers: 1 short stem plant and terminal flowers), which of the following represents the phenotype of the unknown plant:- A- short stem and terminal flowers B- tall stem and terminal flowers C- short stem and axial flowers D- tall stem and axial flowers
C- it is found in the vertebral column. 7-The receptors that have tiny particles of calcium carbonate on top of them, are known as:- A- mechanoreceptors. B- pain receptors. C- chemoreceptors. D- photoreceptors 8-During the first trimester: A- primary germ layers do not form. B- the four embryonic membranes are not formed C- the mother does not feel the movement of the fetus. D- the heart does not start beating 9-Natural killer cells differ from neutrophils in that natural killer cells: - A- are white blood cells. B- contribute to general defenses. C- attack pathogen-infected cells with the pathogen. D- Ingest pathogens 0-The two adjacent figures represent the results of the Hershey and Chase experiments, in which experiment they used ³⁵ S and in which experiment they used ³² P? A- In the first experiment they used ³⁵ S, in the second experiment they used ³⁵ S C- in both experiments they used ³⁵ S D- in both experiments they used ³⁵ S D- in both experiments they used ³⁶ S C- dominant phenotype. B- recessive phenotype C- dominant phenotype and recessive phenotype D- intermediate phenotype 2- According to the adjacent figure that shows the process of DNA replication, after completing this process, which of the choices in the following table is correct	A-by using the codon table, the codon GCU specifies the amino acid alanine in the genetic code of all living organisms B- In the transcription, a part of one of the two DNA strands is used to transcribe tRNA C- The translation can begin even before transcription has finished D- transcription takes place in the nucleus. 48-The promoter differs from the start codon in that the promoter: A- is a specific nucleotide sequence of DNA. B- DNA polymerase binds to it C- indicates where translation should begin D- both (A and B) are correct 49-In the 28-day period of the ovarian and menstrual cycles, which of the following occurs one after the other (in sequence)? (1- Secretion of follicle-stimulating hormone, 2- Formation of corpus luteum, 3- Growth and development of the follicle, 4- Ovulation, 5- The sharp rise in the concentration of luteinizing hormone) A-2 1 3 5 4 B-1 3 5 4 2 C-3 1 2 5 4 D-1 3 2 5 4 50-Which of the following is correct regarding the structure of a DNA molecule? 1.the number of sugar molecules is equal to the number of the phosphate group molecules. 2. each nucleotide can differ from another nucleotide only in the type of nitrogenous base. 3.the nitrogenous base is connected to the phosphate group directly by a covalent bond. A-1, 2. B-1, 3 C-2, 3 D-1, 2, 3
regarding the ratio of pyrimidines and the ratio of purines? The ratio of pyrimidines in theis equal to the ratio of The ratio of pyrimidines in theis NOT EQUAL to the	
purines in the ratio of purines in the	
A Strand 2 , strand 4 Strand 1 , strand 3 B Strand 1 , strand 4 Strand 2 , strand 4	
C Strand 2 , strand 3 Strand 4	
D Strand 1 , strand 3 Strand 3 3	

Kurdistan Region Government- Irag

In the Name of Allah Ministry of Education-High Committee of General Examinations

General exams for preparatory stage (Scientific) For the academic year (2024-2025) Second Sitting



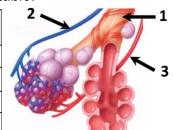


Note: choose the correct answer: - (2 marks for each right answer)

- 1-vesicles fuse with the presynaptic membrane when?
- A- neurotransmitters are broken down by enzymes.
- **B-** an action potential reaches the axon terminal of the presynaptic neuron
- **C-** neurotransmitters are reabsorbed by a postsynaptic cell. **D-** the sodium-potassium pump is activated
- **2-**Which of the following is correct regarding the vas deference?
- **A-** it loops around the urethra.

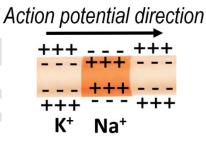
- **B-** each normal male person has two
- **C-** transports semen to the urethra.
- **D-** all of them are correct
- **3-**Based on the adjacent figure, choose the correct answer from the following table: -

	The blood in the blood vessel that is labeled by number 2: -	The blood in the blood vessel that is labeled by number 3: -	During exhalation the air in the structure that is labeled by number 1 passes into the: -
Α	comes from the right ventricle	returns to the left atrium	alveoli
В	returns to the left atrium	comes from the right ventricle	bronchus
С	comes from the right ventricle	returns to the left atrium	bronchus
D	returns to the right ventricle	comes from the left atrium	alveoli



- **4-**According on the adjacent figure that shows the endometrium, maternal portion of placenta, and the fetal portion of placenta, choose the correct answer from the following:-
- **A-** numbers 1 and 2 point to maternal veins,
- **B-** numbers 1 and 2 point to maternal arteries,
- **C-** number 1 points to an umbilical vein, and number 2 points a maternal vein
- **D-** number 1 points to a maternal vein and the number 2 points to an umbilical artery
- **5-**The motor division of the peripheral nervous system controls: -A- skeletal muscle movement
- **B-** regulating smooth muscles **C-** secretion of all of the body's hormones directly **D-** both (A and B) are correct
- **6-**In Mendelian genetics, an allele (factor) is considered as a dominant if:
- **A-** able to express itself only in the homozygous state **B-** able to express itself only in the heterozygous state
- **C-** able to mask the effect of the other allele (factor) in the heterozygous state
- **D-** blending of two alleles occurs in the heterozygous state
- **7-**The adjacent figure shows a part of the neuron axon, which of the following is correct regarding the movement of ions in their specific places on the figure across the neuron axon membrane?

	The movement of ions in their specific places on the figure across the neuron axon membrane			
Α	Sodium and potassium ions exit from the nerve cell			
В	Sodium and potassium ions enter the nerve cell			
С	Sodium ions exit from the nerve cell and potassium ions enter the nerve cell			
D	Sodium ions enter the nerve cell and potassium ions exit from the nerve cell			



- **8-**All of the following groups have a hormone that the site of secretion does not belong to them, **EXCEPT**: -
- **A-** insulin, prostaglandin, glucagon. **B-** oxytocin, epinephrine, antidiuretic hormone **C-** aldosterone, cortisol, glucagon **D-** thyroid stimulating hormone, adrenocorticotropic hormone, follicle-stimulating hormone
- **9-**All of the following occur in the fallopian tube, **EXCEPT**: -
- **A-** formation of morula **B-** formation of zygote **C-** meiosis II of the egg **D-** formation of first polar body **10-**Which of the following is correct regarding the diastole phase?
- **A-** The direction of blood movement is from the atria to the ventricles.
- **B-** It is represented by the P wave in the electrocardiograph (ECG). **C-** It takes longer than the atrial contraction phase. **D-** Blood flows to fill the ventricles

- **11-**The smooth muscle:
- **A-** is found in the female reproductive tract.
- **B-** is arranged in opposing pairs.
- **C-** its muscle fibers are not surrounded by connective tissue. **D-** has both origin and insertion points
- 12-All of the following are bones of the appendicular skeleton, EXCEPT: -A- clavicle **B-** sternum C- fibula **D-** scapula
- **13-**Skeletal muscles:
- **A-** are not attached to the periosteum.
- **B-** are directly attached to the periosteum.
- **C-** are attached to the periosteum by a tendon.
- **D-** both (B and C) are correct
- **14-**Which of the following is correct regarding the secondary immune response when a person is infected with the same pathogen for the second time?
- **A-** protects the person from infecting with a new pathogen. **B-** memory cells are produced for the first time.
- **C-** memory cells immediately recognize it and begin to divide rapidly **D-** both (B and C) are correct
- **15**-According to Mendel's experiments on pea plants, which of the following represents cross-pollination? C-TT × TT **D-** All of them are correct B-TT×#
- **16-**All of the following secrete a fluid that reduces (decreases) friction, **EXCEPT**: -
 - **B-** diaphragm **C-** the tissue that lines the surfaces of the knee joint **D-** pericardium
- **17-**The tissue that forms the outer layer of blood vessels differs from the tissue that forms the inner layer of blood vessels in that the tissue that forms the outer layer of blood vessels -
- **A-** its cells are characterized by cells that are embedded in large amounts of an intercellular substance
- **B-** is a connective tissue **C-** is an epithelial tissue **D-** both (A and B) are correct
- **18-**White blood cells are able to perform their function because:
- **A-** they are capable of secreting blood clotting enzymes. **B-** they are formed in the red bone marrow
- C- they can squeeze their way through openings in the walls of blood vessels into the intercellular fluid.
- **D-** their nucleus and organelles disappear
- **19-**Which of the following secretes estrogen?
- **A-** the mature egg **B-** corpus luteum **C-** growing umbilical cord **D-** All of them are correct
- **20**-Which of the following is **incorrect** regarding the cylinders in the structure of a long bone?
- **A-** contains yellow bone marrow. **B-** consists of lamellae.
- **C-** it is a part of the compact bone. **D-** In the center of each cylinder there is a Haversian canal
- **21-**.....is a molecule that initiates changes inside a cell in response to the binding of a specific substance to a receptor on the outside (surface) of a cell?
- **A-** first messenger. **B-** receptor protein. **C-** second messenger. **D-** hormone-receptor complex
- **22-**Natural killer cells differ from neutrophils in that natural killer cells: -
- **A-** are white blood cells. **B-** contribute to general defenses.
- **C-** attack pathogen-infected cells with the pathogen. **D-** Ingest pathogens
- **23-**The secretory cells and target cells of which of the following hormones are part of the same organ? **B-** gastrin **C-** parathyroid **D-** calcitonin **A-** secretin
- **24-**In which of the following crosses, the genotype ratio of homozygous and heterozygous is equal to 1:1: -
- **A-** monohybrid cross (heterozygous × heterozygous) **B-** monohybrid cross (heterozygous × heterozygous) **C-** incomplete dominance (heterozygous × heterozygous) **D-** All of them are correct
- **25**-Antibodies bind to pathogens stopping their activity and destroying them: -
 - **A-** Indirectly by the specific defenses **B-** by preventing them from entering a cell, thereby blocking its reproduction.
 - **C-** by creating holes in the membranes of pathogen infected cells **D-** All of them are correct
- **26**-Which part of the cerebrum interprets touch information? **A-** cerebral cortex **B-** diencephalon. **C-** midbrain. **D-** the part of the cerebrum that lies beneath the surface of the cerebral cortex
- **27-**In an addict person after removing cocaine from the synapse and dopamine release returns to normal, the postsynaptic neuron: -A- is overstimulated **B-** is under stimulated C- the number of receptor proteins on the postsynaptic cell decreases. D- both (B and C) are correct
- **28-**Which of the following is a sequence of nucleotides in the template strand of a DNA molecule that is transcribed into a codon but then its not translated?
- **A-**TAC **B-** ACT C- ATC **D-** both (B and C) are correct
- **29**-Rods differ from cones in that, rods: **A**-are stimulated by bright light **B** contain rhodopsin. **C-** initiate the production of sharp colors. **D-** respond to different colors

32- The adjaction correct?	cent						•	The state of the s		
		Sample 1 (Donor)	Sample 2 (Recipient)	The result (the slide shape)			Sample 1 (Donor)	Sample 2 (Recipient)	The result (the slide shape)	
	A	A -	A+			В	AB ⁻	O ⁺		
	С	O-	AB+			D	B ⁻	AB ⁻		
				ticles of calcium receptors. C					e known as:- toreceptors	
34- Which of	the	following s	secretes tes	tosterone?			•	•	'	
A- testis			al vesicles	C- prostate	e aland		n - ///	of them are	incorrect	
	ot ti	he followi	na states ti	•	_					tration
B- when a p	ers	on is stre	ssed	he adrenaline is C- after the threa	release at period	ed? d ha	A- lo ns passed	ow blood g	llucose concen	
B- when a p 6- All of the	ers foll	on is stre lowing is o	ssed correct rega	he adrenaline is C- after the threa arding the pivot	release at period joint, E	ed? d ha XC I	A- lo ns passeo EPT : -	ow blood g d. D- k	llucose concen both (A and B) a	
B- when a p 6- All of the A- it is a typ	ers foll de c	on is streation is confiderated in the standard in the standar	ssed correct rega ble joint.	he adrenaline is C- after the threa arding the pivot B -	s release at period joint, <u>E</u> it allows	ed? d ha XC l s the	A- los passeo EPT : - e body to	ow blood g d. D- k	llucose concent both (A and B) a twist.	
B- when a page of the A- it is a type of the A- it is a type of the B- it is found the	ers foll be d id in	on is streatowing is of a moval of a moval of the verte	ssed correct rega ble joint. ebral colum (och's post	he adrenaline is C- after the threa arding the pivot B- an. D- ulates principles	release at period joint, <u>E</u> it allows it is foul s, the pa	ed? d ha XC I s the nd i	A- los passed EPT : - e body to n the axid	ow blood g d. D- b bend and al skeleton rown in the	llucose concent both (A and B) a twist. a laboratory?	
B-when a page of the A- it is a type C- it is found A-In which A-1 and 3.	ers foll pe c d in prin	on is streadowing is of a moval and the verte nciple of K	correct rega ble joint. ebral colum (och's post B- 2 and	he adrenaline is C- after the threa arding the pivot B- an. D- sulates principles	release at period joint, <u>E.</u> it allows it is foul s, the pa C-1 and	ed? d ha XC s the nd i atho	A-los passed EPT: - e body to not the axis ogen is gr	ow blood g d. D- b bend and al skeleton rown in the D- 3 an	llucose concent both (A and B) a twist. a laboratory?	
B-when a page of the A- it is a type C- it is found T-In which A-1 and 3.	ers foll pe c nd in prin	on is streadowing is of a moval and the verte noiple of Kerter following	ssed correct rega ble joint. ebral colum (och's post B- 2 and g defenses	he adrenaline is C- after the threa arding the pivot B- nn. D- ulates principles 4 targets a specif	release at period joint, <u>E</u> , it allows it is four s, the pa C-1 and	ed? d ha XC s the nd i atho l 2. of p	A-los passed EPT: - e body to n the axis agen is grathogen!	ow blood g d. D- b bend and al skeleton rown in the D- 3 an	llucose concent both (A and B) a twist. e laboratory? d 4.	are correct
B-when a page 6-All of the A- it is a type C- it is found 7-In which A-1 and 3. 8-Which of A-mucous	ers foll pe o d in prin	on is streadowing is of a moval of a moval of the verteadown of Karaman of the following of	correct rega ble joint. ebral colum (och's post B- 2 and g defenses B- inflam	he adrenaline is C- after the threa arding the pivot B- an. D- sulates principles	release at period joint, <u>E</u> it allows it is four s, the pa C-1 and fic type se	ed? d ha XC s the nd i atho of p S- sp	A-los passed EPT: - e body to n the axis agen is grathogen!	ow blood g d. D- b bend and al skeleton rown in the D- 3 an	llucose concent both (A and B) a twist. a laboratory?	are correct
B-when a page of the page of t	folloe of the mer the sessions	on is streadowing is of a moval of a moval of the verteaction of Kerner of the following of	correct regalities joint. Sebral column (och's post B- 2 and g defenses B- inflam g always pr	the adrenaline is C-after the threa arding the pivot B- nn. D- ulates principles targets a specification matory respons resenting new a	release at period joint, <u>E</u> it allows it is four s, the pa fic type se C-HI	ed? d ha iXC s the nd i atho of p of p ?	A-los passed EPT: - e body to n the axion gen is grathogen: ecific derivatives.	ow blood g d. D- b bend and al skeleton rown in the D- 3 an ? fenses	Ilucose concent both (A and B) a twist. e laboratory? d 4. D- temperature	response
B-when a page 6-All of the A- it is a type C- it is found A-1 and 3. B-Which of A-mucous B-Which of A-rhinovirus B-The two a B	pers foll per conding pring the mer the uses adjac	on is streadowing is of a moval of a moval of a moval of the vertead of the contract of the co	correct regalities joint. Sebral column Koch's post B-2 and g defenses B-inflam g always pr B- flu ves represent	he adrenaline is C-after the threa arding the pivot B- an. D- culates principles 4 cargets a special amatory responsivesenting new acciruses the results of the	release at period joint, <u>E.</u> it allows it is four s, the pa C-1 and fic type se C ntigens: e Hershe	ed? d ha XCI s the nd i atho of p S- sp PV ey a	A-los passed EPT: - e body to n the axis ogen is grathogen! athogen! ecific dei	ow blood g d. D- k bend and al skeleton rown in the D- 3 an ? fenses D- A	Ilucose concent both (A and B) a twist. e laboratory? d 4. D- temperature	response
B-when a percentage of the per	pers foll pe cond in print the mer the sessadjac perin	on is streadowing is of a moval of a moval of a moval of a moval of the verteaction of the following of the following of the stream of the your ment and you	correct regallel joint. Sebral column Koch's post B-2 and Gefenses B-inflam Galways pr B- flu v Ses represent	he adrenaline is C-after the threa arding the pivot B- an. D- culates principles targets a specification responsives the results of the and in which expect	release at period joint, <u>E.</u> it allows it is four s, the pa fic type of se C-H e Hershe riment th	ed? d ha XC I s the nd i atho 12. of p P S-sp ? V ey a	A-los passed EPT: - e body to not the axio athogen at a second at	ow blood g d. D- k bend and al skeleton rown in the D- 3 an ? fenses D- A e experimen	Ilucose concent both (A and B) a twist. e laboratory? d 4. D- temperature	response
B-when a percentage of the per	pers foll pe c d in prin the mer the uses adjac perin	on is streadowing is of a moval of a moval of a moval of a moval of the verte of following of following of a ment figure of they of the periment of the perime	correct regallel joint. Sebral column (och's post B- 2 and gefenses B- inflam gelways present used ³⁵ S arthey used ³	he adrenaline is C-after the threa arding the pivot B- inn. D- fulates principles 4 targets a specifinatory respons resenting new a viruses t the results of the and in which expenses 5S, in the second	s release at period joint, <u>E.</u> it allows it is four s, the pa c-1 and fic type o ntigens: C-HI e Hershe riment the	ed? d hat XCI s the nd i atho 2. of p -sp -y wey a ney men	A-los passed EPT: - be body to a the axion of the axion	ow blood g d. D- k bend and al skeleton rown in the D- 3 an ? fenses D- A e experiment ? ed ³² P	Ilucose concent both (A and B) a twist. e laboratory? d 4. D- temperature	response
B-when a page 6-All of the A- it is a type C- it is found 7-In which a-1 and 3. B-Which of A-mucous a-1 and a-	person followers followers for the meritable for the perimental followers for the fo	on is streadowing is of a moval of a moval of a moval of a moval of the verte of the contract	correct regallely joint. Sebral column (och's post B- 2 and g defenses B- inflam g always propersent used ³⁵ S are they used ³ they used ³	he adrenaline is C- after the threa arding the pivot B- an. D- culates principles targets a specification responsives the results of the and in which expensives S, in the second	s release at period joint, <u>E.</u> it allows it is four s, the pa c-1 and fic type o ntigens: C-HI e Hershe riment the	ed? d hat XCI s the nd i atho 2. of p -sp -y wey a ney men	A-los passed EPT: - be body to a the axion of the axion	ow blood g d. D- k bend and al skeleton rown in the D- 3 an ? fenses D- A e experiment ? ed ³² P	Ilucose concent both (A and B) a twist. e laboratory? d 4. D- temperature	response
B-when a page 6-All of the A- it is a type C- it is found 7-In which A-1 and 3. B-Which of A-mucous in which expended A- In the first B- in the first C- in both e	pers foll per conding fold in print the mer the uses adjace perint st ex st ex xper	on is streamoning is confident to the verte of the verte	correct regalized formation in the point. coch's post and gefenses and gefenses always properties and they used seep used see	he adrenaline is C- after the threa arding the pivot B- an. D- fulates principles targets a speciful and the results of the resul	s release at period joint, <u>E.</u> it allows it is four s, the pa c-1 and fic type o ntigens: C-HI e Hershe riment the	ed? d have the state of particular to the state	A-los passed EPT: - be body to a the axion of the axion	ow blood g d. D- k bend and al skeleton rown in the D- 3 an ? fenses D- A e experiment ? ed ³² P	alucose concentration (A and B) a twist. I laboratory? d 4. D-temperature All of them are conts,	response orrect
B-when a page 6-All of the A- it is a type C- it is found 7-In which a-1 and 3. B-Which of A-mucous a-1 and a-	pers foll per conding fold in print the mer the uses adjace perint st ex st ex xper	on is streamoning is confident to the verte of the verte	correct regalized formation in the point. coch's post and gefenses and gefenses always properties and they used seep used see	he adrenaline is C- after the threa arding the pivot B- an. D- fulates principles targets a speciful and the results of the resul	s release at period joint, <u>E.</u> it allows it is four s, the pa c-1 and fic type o ntigens: C-HI e Hershe riment the	ed? d have the state of particular to the state	A-los passed EPT: - be body to a the axion of the axion	ow blood g d. D- k bend and al skeleton rown in the D- 3 an ? fenses D- A e experiment ? ed ³² P	alucose concentroth (A and B) a twist. I laboratory? d 4. D-temperature All of them are conts,	response
B-when a p 6-All of the A- it is a typ C- it is foun 7-In which A-1 and 3. 8-Which of A-mucous 9-Which of A- rhinoviru 0-The two a in which exp A- In the firs B- in the firs C- in both e 1-At which	pers foll pe conding pring the mer the uses adjac st ex exper st ex xper step step	on is streamoning is of a moval of a moval of the verte of the property of the property of the property of transport t	correct regalized joint. Sebral column (och's post B- 2 and g defenses B- inflam g always pr B- flu ves represent used ³⁵ S are they used ³⁵ S ey used ³⁵ S ey used ³⁵ S ey used ³⁶ S ey used ³⁷ S ey used ³⁷ S ey used ³⁸ S ey ey used ³⁸ S ey used ³⁸ S ey ey ey	the adrenaline is C- after the threa arding the pivot B- and D- sulates principles the results of the resu	s release at period joint, <u>E</u> joint, <u>E</u> joint, <u>E</u> it allows it is four s, the pa fic type se C ntigens riment th d experin	ed? d hat XCI s the nd i atho ? V ey a ney men men	A-las passed EPT: - e body to a the axis pagen is grathogen; athogen; athogen; athogen; at they use th	ow blood g d. D- k bend and al skeleton rown in the D- 3 fenses D- 4 e experiment ? ed 32 ed 35 ed 35	twist. e laboratory? d 4. D-temperature All of them are conts, Experiment 1	response orrect
B-when a page A- it is a type C- it is found B-In which of A-Mucous B-In the first B- in the first C- in both e B-In both	pers foll pe conding pring the mer the uses adjac st ex exper st ex xper step step	on is streamoning is of a moval of a moval of the verte of the property of the property of the property of transport t	correct regalized joint. Sebral column (och's post B- 2 and g defenses B- inflam g always pr B- flu ves represent used ³⁵ S are they used ³⁵ S ey used ³⁵ S ey used ³⁵ S ey used ³⁶ S ey used ³⁷ S ey used ³⁷ S ey used ³⁸ S ey ey used ³⁸ S ey used ³⁸ S ey ey ey	the adrenaline is C- after the threa arding the pivot B- and D- sulates principles the results of the resu	s release at period joint, <u>E</u> joint, <u>E</u> joint, <u>E</u> it allows it is four s, the pa fic type se C ntigens riment th d experin	ed? d hat XCI s the nd i atho ? V ey a ney men men	A-las passed EPT: - e body to a the axis pagen is grathogen; athogen; athogen; athogen; at they use th	ow blood g d. D- k bend and al skeleton rown in the D- 3 fenses D- 4 e experiment ? ed 32 ed 35 ed 35	twist. e laboratory? d 4. D-temperature All of them are conts, Experiment 1	response orrect
B-when a page A- it is a type C- it is found B-In which of A-mucous B-In the first B- in the first B- in both end B- in both end B- in the first B- in the first B- in the first B- in both end B- in both end B- in both end B- in the 28- in the	person followers followers followers for the merital followers for the followers for the followers for the followers for the followers for fol	on is streamoving is of a moval of a moval of the verte of the control of the con	correct regardle joint. Sebral column (och's post B- 2 and gefenses B- inflamed always properties and sed sed sed sed sed sed sed sed sed se	the adrenaline is C- after the threa arding the pivot B- and D- sulates principles the results of the resu	release at period joint, <u>E</u> joint, <u>E</u> joint, <u>E</u> it allows it is four s, the pa fic type fic type of the Hershe riment the d experin d experin leave the mination	ed? d hat XCI s the nd i atho 2. of p -sp -y when men nen whi	A-las passed EPT: - e body to a the axis ogen is grathogen; ecific defined Chase used 32 Pt they used they	bend and all skeleton rown in the D-3 and person pe	twist. I laboratory? d 4. D-temperature All of them are conts, Experiment 1 embly occurs one after	response orrect Experiment 2

- **43-**According to the adjacent codon table, if this DNA sequence (CTCAAGTGCTTC) complements the strand that serves as a template to make mRNA, which of the following polypeptides is produced?
- **A-** Leucine Tyrosine Arginine Phenylalanine
- **B-** Valine Aspartic Acid Proline Histidine
- **C-** Leucine Lysine Cysteine Phenylalanine
- **D-** Proline Glutamic Acid Leucine valine
- 44-Test cross determines the genotype of any individual who expresses the: -

A- dominant phenotype.

C- dominant phenotype and recessive phenotype

B- recessive phenotype **D-** intermediate phenotype

45-The promoter differs from the start codon in that the promoter: -

A- is a specific nucleotide sequence of DNA.

B- DNA polymerase binds to it **D-** both (A and B) are correct

C- indicates where translation should begin

ש- סטנח (A and B) are correct nort stem and axial flowers and the other is unk

- **46-**In a dihybrid cross between two pea plants, one has short stem and axial flowers and the other is unknown for both traits, these ratios produced (1 short stem plant and axial flowers: 1 short stem plant and terminal flowers), which of the following represents the phenotype of the unknown plant:-
- A- short stem and terminal flowers

B- tall stem and terminal flowers

C- short stem and axial flowers

D-tall stem and axial flowers

Codons in mRNA

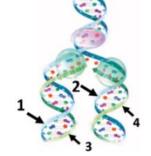
First base

C

G

- 47-In a monohybrid cross, if half of the resulting offspring show the dominant trait, the genotype of the parents: -
- **A-** both are heterozygous. **B-** one is heterozygous and the other is homozygous dominant
- **C-** one is heterozygous and the other is recessive.
- **D-** both are homozygous
- **48-** According to the adjacent figure that shows the process of DNA replication, after completing this process, which of the choices in the following table is correct regarding the ratio of pyrimidines and the ratio of purines?

	.,,	•
	The ratio of pyrimidines in theis equal to the ratio of purines in the	The ratio of pyrimidines in theis <u>NOT EQUAL</u> to the ratio of purines in the
Α	Strand 2 , strand 4	Strand 1 , strand 3
В	Strand 1 , strand 4	Strand 2 , strand 4
С	Strand 2 , strand 3	Strand 3 , strand 4
D	Strand 1 , strand 3	Strand 2 , strand 3



- **49**-Which of the following is <u>incorrect</u> regarding the process of protein synthesis in eukaryotes?
- **A-**by using the codon table, the codon GCU specifies the amino acid alanine in the genetic code of all living organisms
- **B-** In the transcription, a part of one of the two DNA strands is used to transcribe tRNA
- **C-** The translation can begin even before transcription has finished **D-** transcription takes place in the nucleus.
- **50**-Which of the following is correct regarding the structure of a DNA molecule?
- 1.the number of sugar molecules is equal to the number of the phosphate group molecules.
- 2. each nucleotide can differ from another nucleotide only in the type of nitrogenous base.
- 3.the nitrogenous base is connected to the phosphate group directly by a covalent bond.
- **A-**1, 2.
- **B-** 1, 3
- **C-** 2. 3
- **D-** 1, 2, 3

Kurdistan Region Government- Irag Ministry of Education-High Committee of General Examinations

General exams for preparatory stage (Scientific)

For the academic year (2024-2025) Second Sitting

In the Name of Allah

Subject: BIOLOGY Time: 3.30 hours 12th Grade



Note: choose the correct answer: - (2 marks for each right answer)

1-All of the following occur in the fallopian tube, **EXCEPT**: -

A- formation of morula **B-** formation of zygote **C-** meiosis II of the egg **D-** formation of first polar body

2-vesicles fuse with the presynaptic membrane when?

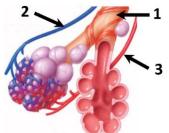
A- neurotransmitters are broken down by enzymes.

B- an action potential reaches the axon terminal of the presynaptic neuron

C- neurotransmitters are reabsorbed by a postsynaptic cell. **D-** the sodium-potassium pump is activated

3-Based on the adjacent figure, choose the correct answer from the following table: -

	The blood in the blood vessel that is labeled by number 2: -	The blood in the blood vessel that is labeled by number 3: -	During exhalation the air in the structure that is labeled by number 1 passes into the: -
Α	comes from the right ventricle	returns to the left atrium	alveoli
В	returns to the left atrium	comes from the right ventricle	bronchus
С	c comes from the right ventricle returns to the left		bronchus
D	returns to the right ventricle	comes from the left atrium	alveoli



4-Which of the following is correct regarding the secondary immune response when a person is infected with the same pathogen for the second time?

A- protects the person from infecting with a new pathogen. **B-** memory cells are produced for the first time. **C-** memory cells immediately recognize it and begin to divide rapidly **D-** both (B and C) are correct

5-Which of the following secretes testosterone?

A- testis **B-** seminal vesicles **C-** prostate gland

D- All of them are incorrect

6-.....is a molecule that initiates changes inside a cell in response to the binding of a specific substance to a receptor on the outside (surface) of a cell?

C- second messenger. **D-** hormone-receptor complex **A-** first messenger. **B-** receptor protein. **7-**In Mendelian genetics, an allele (factor) is considered as a dominant if:

A- able to express itself only in the homozygous state **B-** able to express itself only in the heterozygous state

C- able to mask the effect of the other allele (factor) in the heterozygous state

D- blending of two alleles occurs in the heterozygous state

8-All of the following secrete a fluid that reduces(decreases) friction, **EXCEPT**: -

B- diaphragm **C-** the tissue that lines the surfaces of the knee joint **D-** pericardium

9-The secretory cells and target cells of which of the following hormones are part of the same organ? A- secretin **B-** gastrin

C- parathyroid

D- calcitonin

10-During the first trimester:

A- primary germ layers do not form. **B-** the four embryonic membranes are not formed

C- the mother does not feel the movement of the fetus. **D-** the heart does not start beating

11-In an addict person after removing cocaine from the synapse and dopamine release returns to normal, the postsynaptic neuron: -A- is overstimulated **B-** is under stimulated **D-** both (B and C) are correct **C-** the number of receptor proteins on the postsynaptic cell decreases.

12-In which principle of Koch's postulates principles, the pathogen is grown in the laboratory?

A-1 and 3. **B-**2 and 4 **C-**1 and 2. **D-**3 and 4.

13-All of the following are bones of the appendicular skeleton. **EXCEPT**: -

A- clavicle **B-** sternum C- fibula **D-** scapula

14-Rods differ from cones in that, rods: - **A-**are stimulated by bright light **B-** contain rhodopsin. **C-** initiate the production of sharp colors. **D-** respond to different colors

15-The smooth muscle:

A- is found in the female reproductive tract. **B-** is arranged in opposing pairs.

C- its muscle fibers are not surrounded by connective tissue. **D-** has both origin and insertion points

16-Antibodies bind to pathogens stopping their activity and destroying them: -

A- Indirectly by the specific defenses **B-** by preventing them from entering a cell, thereby blocking its reproduction.

C- by creating holes in the membranes of pathogen infected cells **D-** All of them are correct

17-The adjacent figure shows a part of the neuron axon, which of the following is correct regarding the

	movement of ions in their specific places on the figure across the neuron axon membrane?							
	The movement of ions in their specific places on the figure across the neuron axon membrane	Action potential direction						
Α	Sodium and potassium ions exit from the nerve cell	+++ +++ +++						
В	Sodium and potassium ions enter the nerve cell	+++						
С	Sodium ions exit from the nerve cell and potassium ions enter the nerve cell	++++++						
D	Sodium ions enter the nerve cell and potassium ions exit from the nerve cell	K⁺ Na⁺						
D- t 19 -A A- i C- i	they can squeeze their way through openings in the walls of blood vessible in the walls of blood vessible in the following is correct regarding the pivot joint, EXCEPT : - It is a type of a movable joint. B- it allows the body to bend to so found in the axial skeet the second second in the axial skeet to be a factor of the second second in the axial skeet the second s	d and twist. eleton						
A-1	The receptors that have tiny particles of calcium carbonate on top of their mechanoreceptors. B- pain receptors. C- chemoreceptors. D							
	Which of the following always presenting new antigens? rhinoviruses C- HIV	D- All of them are correct						
	Which of the following blood vessels contains (transports) dark red blood? both superior and inferior vena cava B- Pulmonary veins C- Pulmonary art	erv D- both (A and C) are correct						

23-In which of the following crosses, the genotype ratio of homozygous and heterozygous is equal to 1:1: -

A- monohybrid cross (heterozygous × heterozygous) **B-** monohybrid cross (heterozygous × heterozygous)

C- incomplete dominance (heterozygous × heterozygous) **D-** All of them are correct **24-**The tissue that forms the outer layer of blood vessels differs from the tissue that forms the inner layer of

blood vessels in that the tissue that forms the outer layer of blood vessels -**A-** its cells are characterized by cells that are embedded in large amounts of an intercellular substance

B- is a connective tissue **C-** is an epithelial tissue **D-** both (A and B) are correct

25-Which of the following is correct regarding the vas deference?

A- it loops around the urethra. **B-** each normal male person has two

D- all of them are correct **C-** transports semen to the urethra.

26-Natural killer cells differ from neutrophils in that natural killer cells: -

A- are white blood cells.

B- contribute to general defenses.

C- attack pathogen-infected cells with the pathogen. **D-** Ingest pathogens

27-Which of the following is correct regarding the diastole phase?

A- The direction of blood movement is from the atria to the ventricles.

B- It is represented by the P wave in the electrocardiograph (ECG).

C- It takes longer than the atrial contraction phase. **D-** Blood flows to fill the ventricles

28-Skeletal muscles:

A- are not attached to the periosteum.

B- are directly attached to the periosteum.

C- are attached to the periosteum by a tendon.

D- both (B and C) are correct

29-Which of the following is **incorrect** regarding the cylinders in the structure of a long bone?

A- contains yellow bone marrow.

B- consists of lamellae.

C- it is a part of the compact bone. **D-** In the center of each cylinder there is a Haversian canal

30-Which of the following is a sequence of nucleotides in the template strand of a DNA molecule that is transcribed into a codon but then its not translated?

A-TAC

B- ACT

C- ATC

D- both (B and C) are correct

31-The adjacent table shows the results of mixing several blood samples, which result in the following table is correct?

	Sample 1 (Donor)	Sample 2 (Recipient)	The result (the slide shape)
Α	A -	A ⁺	
С	O-	AB+	

		Sample 2 (Recipient)	The result (the slide shape)
В	AB ⁻	O+	
D	B-	AB⁻	

32-Which of the following secretes estrogen?

A- the mature egg B- corpus luteum C- growing umbilical cord D- All of them are correct

33-Which part of the cerebrum interprets touch information? **A-** cerebral cortex **B-** diencephalon. **C-** midbrain. **D-** the part of the cerebrum that lies beneath the surface of the cerebral cortex

34-In which of the following states the adrenaline is released? **A-**low blood glucose concentration **B-**when a person is stressed **C-**after the threat period has passed. **D-** both (A and B) are correct

35-All of the following groups have a hormone that the site of secretion does not belong to them, EXCEPT: -

A- insulin, prostaglandin, glucagon. B- oxytocin, epinephrine, antidiuretic hormone C- aldosterone, cortisol, glucagon

D- thyroid stimulating hormone, adrenocorticotropic hormone, follicle-stimulating hormone

36-The motor division of the peripheral nervous system controls: - **A-** skeletal muscle movement

B- regulating smooth muscles **C-** secretion of all of the body's hormones directly **D-** both (A and B) are correct

37-According to Mendel's experiments on pea plants, which of the following represents cross-pollination? **A-** Tt × Tt **B-** TT × tt **C-** TT × TT **D-** All of them are correct

A- Tt × Tt **B-** TT × tt **C-** TT × TT **D-** All of then **38-**Which of the following defenses targets a specific type of pathogen?

A-mucous membranes B-inflammatory response C-specific defenses D-temperature response

39-According on the adjacent figure that shows the endometrium, maternal portion of placenta, and the fetal portion of placenta, choose the correct answer from the following:-

A- numbers 1 and 2 point to maternal veins,

B- numbers 1 and 2 point to maternal arteries,

C- number 1 points to an umbilical vein, and number 2 points a maternal vein

D- number 1 points to a maternal vein and the number 2 points to an umbilical artery

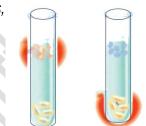
40-The two adjacent figures represent the results of the Hershey and Chase experiments, in which experiment they used ³⁵S and in which experiment they used ³²P?

A- In the first experiment they used ³⁵S, in the second experiment they used ³²P

B- in the first experiment they used ³²P, in the second experiment they used ³⁵S

C- in both experiments they used ³⁵S

D- in both experiments they used ³²P



Experiment 1 Experiment 2

41-Which of the following is incorrect regarding the process of protein synthesis in eukaryotes?

A-by using the codon table, the codon GCU specifies the amino acid alanine in the genetic code of all living organisms

B- In the transcription, a part of one of the two DNA strands is used to transcribe tRNA

C- The translation can begin even before transcription has finished **D-** transcription takes place in the nucleus.

42-In a monohybrid cross, if half of the resulting offspring show the dominant trait, the genotype of the parents: -

A- both are heterozygous. B- one is heterozygous and the other is homozygous dominant

C- one is heterozygous and the other is recessive. **D-** both are homozygous

43-According to the adjacent codon table, if this DNA sequence (CTCAAGTGCTTC) complements the strand that serves as a template to make mRNA, which of the following polypeptides is produced?

A- Leucine – Tyrosine –Arginine – Phenylalanine

B- Valine – Aspartic Acid – Proline – Histidine

C- Leucine – Lysine – Cysteine – Phenylalanine

D- Proline – Glutamic Acid – Leucine – valine

Codons in mRNA					
First base Second base					Third base
	U	С	Α	G	
U	Phenylalanine	Serine	Tyrosine	Cysteine	U
	Phenylalanine	Serine	Tyrosine	Cysteine	C
	Leucine	Serine	Stop	Stop	A
	Leucine	Serine	Stop	Tryptophan	G
С	Leucine	Proline	Histidine	Arginine	U
	Leucine	Proline	Histidine	Arginine	C
	Leucine	Proline	Glutamine	Arginine	A
	Leucine	Proline	Glutamine	Arginine	G
Α	Isoleucine	Threonine	Asparagine	Serine	U
	Isoleucine	Threonine	Asparagine	Serine	C
	Isoleucine	Threonine	Lysine	Arginine	A
	Methionine (start)	Threonine	Lysine	Arginine	G
G	Valine	Alanine	Aspartic acid	Glycine	U
	Valine	Alanine	Aspartic acid	Glycine	C
	Valine	Alanine	Glutamic acid	Glycine	A
	Valine	Alanine	Glutamic acid	Glycine	G

44-In a dihybrid cross between two pea plants, one has short stem and axial flowers and the other is unknown for both traits, these ratios produced (1 short stem plant and axial flowers: 1 short stem plant and terminal flowers), which of the following represents the phenotype of the unknown plant:-

A- short stem and terminal flowers

B- tall stem and terminal flowers

C- short stem and axial flowers

D-tall stem and axial flowers

45-Which of the following is correct regarding the structure of a DNA molecule?

1.the number of sugar molecules is equal to the number of the phosphate group molecules.

2. each nucleotide can differ from another nucleotide only in the type of nitrogenous base.

3.the nitrogenous base is connected to the phosphate group directly by a covalent bond.

A-1, 2.

B- 1. 3

C- 2, 3

D- 1, 2, 3

46-The promoter differs from the start codon in that the promoter: -

A- is a specific nucleotide sequence of DNA.

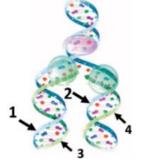
B- DNA polymerase binds to it

C- indicates where translation should begin

D- both (A and B) are correct

47- According to the adjacent figure that shows the process of DNA replication, after completing this process, which of the choices in the following table is correct regarding the ratio of pyrimidines and the ratio of purines?

	The ratio of pyrimidines in theis equal to the ratio of purines in the	The ratio of pyrimidines in theis <u>NOT EQUAL</u> to the ratio of purines in the
Α	Strand 2 , strand 4	Strand 1 , strand 3
В	Strand 1 , strand 4	Strand 2 , strand 4
С	Strand 2 , strand 3	Strand 3 , strand 4
D	Strand 1 , strand 3	Strand 2 , strand 3



48-In the 28-day period of the ovarian and menstrual cycles, which of the following occurs one after the other (in sequence)? (1- Secretion of follicle-stimulating hormone, 2- Formation of corpus luteum, 3- Growth and development of the follicle, 4- Ovulation, 5- The sharp rise in the concentration of luteinizing hormone)

B-1 3 5 4 2 **D-**1 3 2 5 4 4

49-Test cross determines the genotype of any individual who expresses the: -

A- dominant phenotype.

B- recessive phenotype

C- dominant phenotype and recessive phenotype

D- intermediate phenotype

50-At which step of translation does the last tRNA leave the ribosome?

A- elongation

B- initiation

C- termination

D- disassembly

Subject: BIOLOGY Time: 3.30 hours 12th Grade



Note: choose the correct answer: - (2 marks for each right answer)

- **1-**Antibodies bind to pathogens stopping their activity and destroying them: -
- **A-** Indirectly by the specific defenses **B-** by preventing them from entering a cell, thereby blocking its reproduction.
- **C-** by creating holes in the membranes of pathogen infected cells
- **D-** All of them are correct A- skeletal muscle movement
- **2-**The motor division of the peripheral nervous system controls: -
- **B-** regulating smooth muscles **C-** secretion of all of the body's hormones directly **D-** both (A and B) are correct
- **3-**During the first trimester:
- **A-** primary germ layers do not form. **B-** the four embryonic membranes are not formed
- **C-** the mother does not feel the movement of the fetus.
- **D-** the heart does not start beating

- **4-**The smooth muscle:
- **A-** is found in the female reproductive tract.

- **B-** is arranged in opposing pairs.
- **C-** its muscle fibers are not surrounded by connective tissue. **D-** has both origin and insertion points
- **5-**Which part of the cerebrum interprets touch information? **A-** cerebral cortex
 - **B-** diencephalon.
- **C-** midbrain. **D-** the part of the cerebrum that lies beneath the surface of the cerebral cortex
- **6-**In which of the following crosses, the genotype ratio of homozygous and heterozygous is equal to 1:1: -A- monohybrid cross (heterozygous × heterozygous) B- monohybrid cross (heterozygous × heterozygous)
- **C-** incomplete dominance (heterozygous × heterozygous) **D-** All of them are correct
- **7-**Natural killer cells differ from neutrophils in that natural killer cells: -
- **A-** are white blood cells.

- **B-** contribute to general defenses.
- **C-** attack pathogen-infected cells with the pathogen.
- **D-** Ingest pathogens
- **8-**In which principle of Koch's postulates principles, the pathogen is grown in the laboratory?
- **A-**1 and 3.
- **B-**2 and 4
- **C-1** and 2.
- **D-**3 and 4.
- **A-**low blood glucose concentration **9-**In which of the following states the adrenaline is released? **C-**after the threat period has passed. **B-**when a person is stressed **D-** both (A and B) are correct
- **10-**.....is a molecule that initiates changes inside a cell in response to the binding of a specific substance
- to a receptor on the outside (surface) of a cell?
- **C-** second messenger. **D-** hormone-receptor complex **A-** first messenger. **B-** receptor protein.
- **11-**The secretory cells and target cells of which of the following hormones are part of the same organ?
- A- secretin
- **B-** gastrin
- **C-** parathyroid
- **D-** calcitonin
- 12-The adjacent table shows the results of mixing several blood samples, which result in the following table is

correct?

	Sample 1 (Donor)	Sample 2 (Recipient)	The result (the slide shape)
Α	A -	A ⁺	
С	O-	AB ⁺	

		Sample 2 (Recipient)	The result (the slide shape)
В	AB ⁻	O ⁺	
D	B⁻	AB ⁻	

- 13-Which of the following always presenting new antigens?
- **A-** rhinoviruses
- **B-** flu viruses
- **D-** All of them are correct
- 14-All of the following are bones of the appendicular skeleton, EXCEPT: -
- **A-** clavicle
- **B-** sternum

A-mucous membranes **B-**inflammatory response

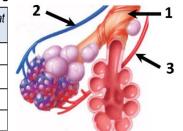
- **C-** fibula

D- All of them are incorrect

- **15**-Which of the following secretes testosterone? **B-** seminal vesicles C- prostate gland
- A- testis
- **16-**Which of the following defenses targets a specific type of pathogen?
 - **C-**specific defenses
- **D**-temperature response

- 17-Which of the following is correct regarding the secondary immune response when a person is infected with the same pathogen for the second time?
- **A-** protects the person from infecting with a new pathogen. **B-** memory cells are produced for the first time. **C-** memory cells immediately recognize it and begin to divide rapidly **D-** both (B and C) are correct
- **18**-Which of the following blood vessels contains (transports) dark red blood?
- **A-** both superior and inferior vena cava **B-** Pulmonary veins **C-** Pulmonary artery **D-** both (A and C) are correct
- **19-**Based on the adjacent figure, choose the correct answer from the following table: -

	The blood in the blood vessel that is labeled by number 2: -	The blood in the blood vessel that is labeled by number 3: -	During exhalation the air in the structure that is labeled by number 1 passes into the: -	
Α	comes from the right ventricle	returns to the left atrium	alveoli	
В	returns to the left atrium	comes from the right ventricle	bronchus	
С	comes from the right ventricle	returns to the left atrium	bronchus	
D	returns to the right ventricle	comes from the left atrium	alveoli	



- **20-**All of the following occur in the fallopian tube, **EXCEPT**: -
- **B-** formation of zygote **A-** formation of morula **C-** meiosis II of the egg **D-** formation of first polar body
- **21-**The receptors that have tiny particles of calcium carbonate on top of them, are known as:-
- **A-** mechanoreceptors. **B-** pain receptors. **C-** chemoreceptors. **D-** photoreceptors
- **22-**According on the adjacent figure that shows the endometrium, maternal portion of placenta, and the fetal portion of placenta, choose the correct answer from the following:-
- **A-** numbers 1 and 2 point to maternal veins,
- **B-** numbers 1 and 2 point to maternal arteries,
- **C-** number 1 points to an umbilical vein, and number 2 points a maternal vein
- **D-** number 1 points to a maternal vein and the number 2 points to an umbilical artery
- **23-**Which of the following is correct regarding the diastole phase?
- **A-** The direction of blood movement is from the atria to the ventricles.
- **B-** It is represented by the P wave in the electrocardiograph (ECG).
- **C-** It takes longer than the atrial contraction phase. **D-** Blood flows to fill the ventricles
- **24-**White blood cells are able to perform their function because:
- **A-** they are capable of secreting blood clotting enzymes. **B-** they are formed in the red bone marrow **C-** they can squeeze their way through openings in the walls of blood vessels into the intercellular fluid.
- **D-** their nucleus and organelles disappear
- **25**-All of the following is correct regarding the pivot joint, **EXCEPT**: -
- **A-** it is a type of a movable joint. **C-** it is found in the vertebral column.
- **B-** it allows the body to bend and twist. **D-** it is found in the axial skeleton
- **26-**In Mendelian genetics, an allele (factor) is considered as a dominant if:
- **A-** able to express itself only in the homozygous state **B-** able to express itself only in the heterozygous state
- **C-** able to mask the effect of the other allele (factor) in the heterozygous state **D-** blending of two alleles occurs in the heterozygous state
- **27-**Rods differ from cones in that, rods: **A-**are stimulated by bright light
 - **B-** contain rhodopsin. **C-** initiate the production of sharp colors. **D-** respond to different colors
- **28-**In an addict person after removing cocaine from the synapse and dopamine release returns to normal, A- is overstimulated **B-** is under stimulated the postsynaptic neuron: -
- **C-** the number of receptor proteins on the postsynaptic cell decreases.
 - **D-** both (B and C) are correct

- **29-**Skeletal muscles:
- **A-** are not attached to the periosteum.
- **B-** are directly attached to the periosteum.
- **C-** are attached to the periosteum by a tendon.
- **D-** both (B and C) are correct **30**-All of the following secrete a fluid that reduces(decreases) friction, **EXCEPT**: -
- **A-** pleura **B-** diaphragm **C-** the tissue that lines the surfaces of the knee joint
 - **D-** pericardium
- **31-**All of the following groups have a hormone that the site of secretion does not belong to them, EXCEPT: -**A-** insulin, prostaglandin, glucagon. **B-** oxytocin, epinephrine, antidiuretic hormone **C-** aldosterone, cortisol, glucagon
- **D-** thyroid stimulating hormone, adrenocorticotropic hormone, follicle-stimulating hormone

	tran	Which of the following is a sequence of nucleotides in the template strand nscribed into a codon but then its not translated?	
		TAC B- ACT C- ATC D- both (B and C) are co	
3		The adjacent figure shows a part of the neuron axon, which of the following is evement of ions in their specific places on the figure across the neuron axon r	•
		The movement of ions in their specific places on the figure across the neuron axon membrane	Action potential direction
	Α	Sodium and potassium ions exit from the nerve cell	+++ +++
	\vdash		
	В		+++
	С	,	K ⁺ Na ⁺
	D	Sodium ions enter the nerve cell and potassium ions exit from the nerve cell	N Na
	A- 7	According to Mendel's experiments on pea plants, which of the following re Tt × Tt	
3	5 -ve	vesicles fuse with the presynaptic membrane when?	
	B- a	neurotransmitters are broken down by enzymes. an action potential reaches the axon terminal of the presynaptic neuron neurotransmitters are reabsorbed by a postsynaptic cell. D- the sodium	-notassium numn is activated
3		The tissue that forms the outer layer of blood vessels differs from the tissu	
		ood vessels in that the tissue that forms the outer layer of blood vessels -	o that forms the fillion layer of
		its cells are characterized by cells that are embedded in large amounts of	an intercellular substance
		,	nd B) are correct
		Which of the following secretes estrogen?	D All 511
		the mature egg	
		Which of the following is <u>incorrect</u> regarding the cylinders in the structure	of a long bone?
	C- il	contains yellow bone marrow. it is a part of the compact bone. B- consists of lamellae. D- In the center of each cylinder the	here is a Haversian canal
		Which of the following is correct regarding the vas deference?	ioro io a riavordiari cariai
_	A-il	it loops around the urethra. B- each normal male per	erson has two
		transports semen to the urethra. D- all of them are corre	
4	0- T	The two adjacent figures represent the results of the Hershey and Chase experi	ments,
	in w	which experiment they used ³⁵ S and in which experiment they used ³² P?	
	A- II	In the first experiment they used 35 S, in the second experiment they used 32 P	
	B- ii	in the first experiment they used 32 P, in the second experiment they used 35 S	
	C- ii	in both experiments they used ³⁵ S	
	D- ii	in both experiments they used ³² P	Experiment 1 Experiment 2
4	1- W	Which of the following is correct regarding the structure of a DNA molecule	9?
		he number of sugar molecules is equal to the number of the phosphate gro	
		each nucleotide can differ from another nucleotide only in the type of nitrog	•
		he nitrogenous base is connected to the phosphate group directly by a co	
		1, 2. B- 1, 3 C- 2, 3 D- 1, 2, 3	
4	2- T	Test cross determines the genotype of any individual who expresses the: -	
			ve phenotype
			ediate phenotype
4		The promoter differs from the start codon in that the promoter: -	• • •
		is a specific nucleotide sequence of DNA. B- DNA polymerase bi	inds to it
		indicates where translation should begin D- both (A and B) are of	

- **44-**According to the adjacent codon table, if this DNA sequence (CTCAAGTGCTTC) complements the strand that serves as a template to make mRNA, which of the following polypeptides is produced?

 Codons in mRN First base

 U Phenylais Leucine Leucine
- **A-** Leucine Tyrosine Arginine Phenylalanine
- **B-** Valine Aspartic Acid Proline Histidine
- **C-** Leucine Lysine Cysteine Phenylalanine
- **D-** Proline Glutamic Acid Leucine valine

ı	0000113	III IIIIXIVA				
۱	First base		Secon	d base		Third base
ı		U	С	A	G	
	U	Phenylalanine Phenylalanine Leucine Leucine	Serine Serine Serine Serine	Tyrosine Tyrosine Stop Stop	Cysteine Cysteine Stop Tryptophan	U C A G
	С	Leucine Leucine Leucine Leucine	Proline Proline Proline Proline	Histidine Histidine Glutamine Glutamine	Arginine Arginine Arginine Arginine	U C A G
	Α	Isoleucine Isoleucine Isoleucine Methionine (start)	Threonine Threonine Threonine Threonine	Asparagine Asparagine Lysine Lysine	Serine Serine Arginine Arginine	UCAG
	G	Valine Valine Valine Valine	Alanine Alanine Alanine Alanine	Aspartic acid Aspartic acid Glutamic acid Glutamic acid	Glycine Glycine Glycine Glycine	U C A G

- 45-In a monohybrid cross, if half of the resulting offspring show the dominant trait, the genotype of the parents: -
- **A-** both are heterozygous. **B-** one is heterozygous and the other is homozygous dominant
- **C-** one is heterozygous and the other is recessive. **D-** both
 - **D-** both are homozygous
- **46-**In the 28-day period of the ovarian and menstrual cycles, which of the following occurs one after the other (in sequence)? (1- Secretion of follicle-stimulating hormone, 2- Formation of corpus luteum, 3- Growth and development of the follicle, 4- Ovulation, 5- The sharp rise in the concentration of luteinizing hormone)

4- 2	1 1	3	5	4	L
C- 3	1	2	5	4	I

- **B-**1 3 5 4 2 **D-**1 3 2 5 4
- **47-**In a dihybrid cross between two pea plants, one has short stem and axial flowers and the other is unknown for both traits, these ratios produced (1 short stem plant and axial flowers: 1 short stem plant and terminal flowers), which of the following represents the phenotype of the unknown plant:-
- **A-** short stem and terminal flowers
- **B-** tall stem and terminal flowers

C- short stem and axial flowers

A- elongation

- **D-**tall stem and axial flowers
- **48**-Which of the following is <u>incorrect</u> regarding the process of protein synthesis in eukaryotes?
- **A-**by using the codon table, the codon GCU specifies the amino acid alanine in the genetic code of all living organisms

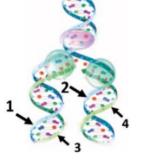
C- termination

- **B-** In the transcription, a part of one of the two DNA strands is used to transcribe tRNA
- **C-** The translation can begin even before transcription has finished **D-** transcription takes place in the nucleus.
- **49**-At which step of translation does the last tRNA leave the ribosome?

B- initiation

- **D-** disassembly
- **50-** According to the adjacent figure that shows the process of DNA replication, after completing this process, which of the choices in the following table is correct regarding the ratio of pyrimidines and the ratio of purines?

	The ratio of pyrimidines in theis equal to the ratio of purines in the	The ratio of pyrimidines in theis <u>NOT EQUAL</u> to the ratio of purines in the
Α	Strand 2 , strand 4	Strand 1 , strand 3
В	Strand 1 , strand 4	Strand 2 , strand 4
С	Strand 2 , strand 3	Strand 3 , strand 4
D	Strand 1 , strand 3	Strand 2 , strand 3



Kurdistan Region Government- Iraq In the Name of Allah Ministry of Education-High Committee of General Examinations
General exams for preparatory stage (Scientific)

General exams for preparatory stage (Scientific) For the academic year (2024-2025) Second Sitting Subject: BIOLOGY Time: 3.30 hours 12th Grade



Note: choose the correct answer: - (2 marks for each right answer)

1-Rods differ from cones in that, rods: - A-are stimulated by bright light B- contain rhodopsin.
 C- initiate the production of sharp colors. D- respond to different colors

2-The smooth muscle:

A- is found in the female reproductive tract. **B-** is arranged.

B- is arranged in opposing pairs.

C- its muscle fibers are not surrounded by connective tissue. **D-** has both origin and insertion points

3-Which of the following is correct regarding the secondary immune response when a person is infected with the same pathogen for the second time?

A- protects the person from infecting with a new pathogen. **B-** memory cells are produced for the first time.

C- memory cells immediately recognize it and begin to divide rapidly D- both (B and C) are correct

4-Which of the following secretes testosterone?

A- testis **B-** seminal vesicles

C- prostate gland

D- All of them are incorrect

5-In Mendelian genetics, an allele (factor) is considered as a dominant if:

A- able to express itself only in the homozygous state **B-** able to express itself only in the heterozygous state

C- able to mask the effect of the other allele (factor) in the heterozygous state

D- blending of two alleles occurs in the heterozygous state

6-Which of the following is **incorrect** regarding the cylinders in the structure of a long bone?

A- contains yellow bone marrow.

B- consists of lamellae.

C- it is a part of the compact bone. **D-** In the center of each cylinder there is a Haversian canal

7-All of the following groups have a hormone that the site of secretion **does not** belong to them, **EXCEPT**: -

A- insulin, prostaglandin, glucagon. **B-** oxytocin, epinephrine, antidiuretic hormone **C-** aldosterone, cortisol, glucagon

D- thyroid stimulating hormone, adrenocorticotropic hormone, follicle-stimulating hormone

8-The tissue that forms the outer layer of blood vessels differs from the tissue that forms the inner layer of blood vessels in that the tissue that forms the outer layer of blood vessels -

A- its cells are characterized by cells that are embedded in large amounts of an intercellular substance

B- is a connective tissue **C-** is an epithelial tissue **D-** both (A and B) are correct

9-Which of the following is correct regarding the diastole phase?

A- The direction of blood movement is from the atria to the ventricles.

B- It is represented by the P wave in the electrocardiograph (ECG).

C- It takes longer than the atrial contraction phase. **D-** Blood flows to fill the ventricles

10-According on the adjacent figure that shows the endometrium, maternal portion of placenta,

and the fetal portion of placenta, choose the correct answer from the following:-

A- numbers 1 and 2 point to maternal veins,

B- numbers 1 and 2 point to maternal arteries,

C- number 1 points to an umbilical vein, and number 2 points a maternal vein

D- number 1 points to a maternal vein and the number 2 points to an umbilical artery

11-The receptors that have tiny particles of calcium carbonate on top of them, are known as:-

A- mechanoreceptors. B- pain receptors. C- chemoreceptors. D- photoreceptors

12-In an addict person after removing cocaine from the synapse and dopamine release returns to normal, the postsynaptic neuron: - **A-** is overstimulated **B-** is under stimulated

C- the number of receptor proteins on the postsynaptic cell decreases.
D- both (B and C) are correct

13-During the first trimester:

A- primary germ layers do not form. **B-** the four embryonic membranes are not formed

C- the mother does not feel the movement of the fetus. **D-** the heart does not start beating

14-Which of the following defenses targets a specific type of pathogen?

A-mucous membranes B-inflammatory response C-specific defenses D-temperature response

15-Which of the following blood vessels contains (transports) dark red blood?

A- both superior and inferior vena cava B- Pulmonary veins C- Pulmonary artery D- both (A and C) are correct

16-Which of the following always presenting new antigens?

A- rhinoviruses B- flu viruses C-HIV

17-Natural killer cells differ from neutrophils in that natural killer cells: -

A- are white blood cells. **B-** contribute to general defenses. **C-** attack pathogen-infected cells with the pathogen. **D-** Ingest pathogens

18-Which part of the cerebrum interprets touch information? **A**- cerebral cortex **B**- diencephalon.

C- midbrain. **D-** the part of the cerebrum that lies beneath the surface of the cerebral cortex

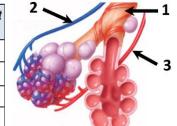
19-All of the following is correct regarding the pivot joint, **EXCEPT**: -

A- it is a type of a movable joint. **B-** it allows the body to bend and twist.

C- it is found in the vertebral column. **D-** it is found in the axial skeleton

20-Based on the adjacent figure, choose the correct answer from the following table: -

	The blood in the blood vessel that is labeled by number 2: -	The blood in the blood vessel that is labeled by number 3: -	During exhalation the air in the structure that is labeled by number 1 passes into the: -		
Α	comes from the right ventricle	returns to the left atrium	alveoli		
В	returns to the left atrium	comes from the right ventricle	bronchus		
С	comes from the right ventricle	returns to the left atrium	bronchus		
D	returns to the right ventricle	comes from the left atrium	alveoli		



D- All of them are correct

21-The secretory cells and target cells of which of the following hormones are part of the same organ? **A-** secretin **B-** gastrin **C-** parathyroid **D-** calcitonin

22-All of the following secrete a fluid that reduces (decreases) friction, EXCEPT: -

A- pleura B- diaphragm C- the tissue that lines the surfaces of the knee joint D- pericardium

23-White blood cells are able to perform their function because:

A- they are capable of secreting blood clotting enzymes. **B-** they are formed in the red bone marrow **C-** they can squeeze their way through openings in the walls of blood vessels into the intercellular fluid.

D- their nucleus and organelles disappear

24-The adjacent table shows the results of mixing several blood samples, which result in the following table is correct?

	Sample 1 (Donor)	Sample 2 (Recipient)	The result (the slide shape)
Α	A -	A ⁺	
С	0-	AB+	

	Sample 1 (Donor)	Sample 2 (Recipient)	The result (the slide shape)
В	AB ⁻	O ⁺	
D	B-	AB ⁻	

25-In which principle of Koch's postulates principles, the pathogen is grown in the laboratory? **A-1** and 3. **B-2** and 4 **C-1** and 2. **D-3** and 4.

26-Which of the following is correct regarding the vas deference?

A- it loops around the urethra. **B-** each normal male person has two

C- transports semen to the urethra. D- all of them are correct

27-All of the following occur in the fallopian tube, **EXCEPT**: -

A- formation of morula **B-** formation of zygote **C-** meiosis II of the egg **D-** formation of first polar body

28-In which of the following crosses, the genotype ratio of homozygous and heterozygous is equal to 1:1: -

A- monohybrid cross (heterozygous × heterozygous) **B-** monohybrid cross (heterozygous × heterozygous)

C- incomplete dominance (heterozygous × heterozygous) **D-** All of them are correct

29-Antibodies bind to pathogens stopping their activity and destroying them: -

B- corpus luteum

A- Indirectly by the specific defenses **B-** by preventing them from entering a cell, thereby blocking its reproduction.

C- by creating holes in the membranes of pathogen infected cells **D-** All of them are correct **30-**Which of the following secretes estrogen?

C- growing umbilical cord **D**-

D- All of them are correct

26

A- the mature egg

		which of the following states the adrenaline is released? A-low be a person is stressed C-after the threat period has passed.	
	32- Ad	cording to Mendel's experiments on pea plants, which of the following	represents cross-pollination?
		× Tt B- TT × tt C- TT × TT D- All of them are	
	trans	hich of the following is a sequence of nucleotides in the template stran cribed into a codon but then its not translated?	
	A- T/	= 1101 = 1101 (= 11101)	correct
ı		sicles fuse with the presynaptic membrane when? eurotransmitters are broken down by enzymes.	
ı		a action potential reaches the axon terminal of the presynaptic neuron	
	C- n	eurotransmitters are reabsorbed by a postsynaptic cell. D- the sodiu	m-potassium pump is activated
		is a molecule that initiates changes inside a cell in response to the receptor on the outside (surface) of a cell?	e binding of a specific substance
ı		st messenger. B- receptor protein. C- second messenger. D	- hormone-receptor complex
ı		e adjacent figure shows a part of the neuron axon, which of the following	<u> </u>
	move	ement of ions in their specific places on the figure across the neuron axo	n membrane?
		The movement of ions in their specific places on the figure across the neuron axon membrane	Action potential direction
	Α	Sodium and potassium ions exit from the nerve cell	+++ +++
	В	Sodium and potassium ions enter the nerve cell	+++
	С	Sodium ions exit from the nerve cell and potassium ions enter the nerve cell	+++ +++
	D	Sodium ions enter the nerve cell and potassium ions exit from the nerve cell	K ⁺ Na ⁺
	37- Sk	eletal muscles:	
ı	A- a	re not attached to the periosteum B- are directly attach	ed to the periosteum.
		re attached to the periosteum by a tendon. D- both (B and C) are	
			tal muscle movement
		gulating smooth muscles C- secretion of all of the body's hormones direct of the following are bones of the appendicular skeleton, EXCEPT : -	y D- both (A and B) are correct
		avicle B- sternum C- fibula D- scapula	
	40- Th	e two adjacent figures represent the results of the Hershey and Chase expe	eriments,
ı	in wh	ich experiment they used ³⁵ S and in which experiment they used ³² P?	
	A- In	the first experiment they used ³⁵ S, in the second experiment they used ³² H	
		the first experiment they used ³² P, in the second experiment they used ³⁵ S	
	C- in	both experiments they used ³⁵ S	
	D- in	both experiments they used ³² P	Experiment 1 Experiment 2
	41 -W	nich of the following is <u>incorrect</u> regarding the process of protein synthesis in e	eukaryotes?
ı		using the codon table, the codon GCU specifies the amino acid alanine in the	
	B- In	the transcription, a part of one of the two DNA strands is used to transcribe tR	NA
ı	C- TI	ne translation can begin even before transcription has finished D- transcrip	tion takes place in the nucleus.
		hich of the following is correct regarding the structure of a DNA molecu	
ı		number of sugar molecules is equal to the number of the phosphate	•
ı		ch nucleotide can differ from another nucleotide only in the type of niti	•
	3.tne A- 1,	nitrogenous base is connected to the phosphate group directly by a c 2. B- 1, 3 C- 2, 3 D- 1, 2	
	-	st cross determines the genotype of any individual who expresses the	
		,	sive phenotype
		, , , , , , , , , , , , , , , , , , , ,	nediate phenotype
		The many process of the ma	
1			

- **44**-At which step of translation does the last tRNA leave the ribosome?
- A- elongation E
- **B-** initiation
- C- termination
- **D-** disassembly
- 45-In a monohybrid cross, if half of the resulting offspring show the dominant trait, the genotype of the parents: -
- **A-** both are heterozygous. **B-** one is heterozygous and the other is homozygous dominant
- **C-** one is heterozygous and the other is recessive. **D-** both are homozygous
- **46-**In a dihybrid cross between two pea plants, one has short stem and axial flowers and the other is unknown for both traits, these ratios produced (1 short stem plant and axial flowers: 1 short stem plant and terminal flowers), which of the following represents the phenotype of the unknown plant:-
- **A-** short stem and terminal flowers
- **B-** tall stem and terminal flowers

C- short stem and axial flowers

D-tall stem and axial flowers

Codons in mRNA

First base

U

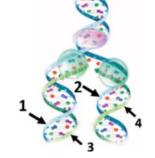
C

Α

G

47- According to the adjacent figure that shows the process of DNA replication, after completing this process, which of the choices in the following table is correct regarding the ratio of pyrimidines and the ratio of purines?

	The ratio of pyrimidines in theis equal to the ratio of purines in the	The ratio of pyrimidines in theis <u>NOT EQUAL</u> to the ratio of purines in the
Α	Strand 2 , strand 4	Strand 1 , strand 3
В	Strand 1 , strand 4	Strand 2 , strand 4
С	Strand 2 , strand 3	Strand 3 , strand 4
D	Strand 1 , strand 3	Strand 2 , strand 3



48-In the 28-day period of the ovarian and menstrual cycles, which of the following occurs one after the other (in sequence)? (1- Secretion of follicle-stimulating hormone, 2- Formation of corpus luteum, 3- Growth and development of the follicle, 4- Ovulation, 5- The sharp rise in the concentration of luteinizing hormone)

A- 2	1	3	5	4
C- 3	1	2	5	4

B-1 3 5 4 2 **D-**1 3 2 5 4

Second base

Aspartic acid Aspartic acid Glutamic acid

Glycine Glycine Glycine Glycine

- **49**-According to the adjacent codon table, if this DNA sequence (CTCAAGTGCTTC) complements the strand that serves as a template to make mRNA, which of the following polypeptides is produced?
- **A-** Leucine Tyrosine –Arginine Phenylalanine
- **B-** Valine Aspartic Acid Proline Histidine
- **C-** Leucine Lysine Cysteine Phenylalanine
- **D-** Proline Glutamic Acid Leucine valine
- **50-**The promoter differs from the start codon in that the promoter: -
- **A-** is a specific nucleotide sequence of DNA.
- **B-** DNA polymerase binds to it

Alanine Alanine Alanine

- **C-** indicates where translation should begin
- **D-** both (A and B) are correct

Kurdistan Region Government- Irag In the Name of Allah Ministry of Education-High Committee of General Examinations

General exams for preparatory stage (Scientific) For the academic year (2024-2025) Second Sitting Subject: BIOLOGY Time: 3.30 hours 12th Grade



Note: choose the correct answer: - (2 marks for each right answer)

- **1-**The tissue that forms the outer layer of blood vessels differs from the tissue that forms the inner layer of blood vessels in that the tissue that forms the outer layer of blood vessels -
- **A-** its cells are characterized by cells that are embedded in large amounts of an intercellular substance
- **B-** is a connective tissue
- **C-** is an epithelial tissue
- **D-** both (A and B) are correct

D- All of them are correct

D- All of them are correct

- **2-**Which of the following is correct regarding the diastole phase?
- **A-** The direction of blood movement is from the atria to the ventricles.
- **B-** It is represented by the P wave in the electrocardiograph (ECG).
- **C-** It takes longer than the atrial contraction phase. **D-** Blood flows to fill the ventricles
- **3-**According on the adjacent figure that shows the endometrium, maternal portion of placenta, and the fetal portion of placenta, choose the correct answer from the following:-
- **A-** numbers 1 and 2 point to maternal veins,
- **B-** numbers 1 and 2 point to maternal arteries,
- **C-** number 1 points to an umbilical vein, and number 2 points a maternal vein
- **D-** number 1 points to a maternal vein and the number 2 points to an umbilical artery
- **4-**Which of the following is correct regarding the secondary immune response when a person is infected with the same pathogen for the second time?
- **A-** protects the person from infecting with a new pathogen. **B-** memory cells are produced for the first time.
- **C-** memory cells immediately recognize it and begin to divide rapidly **D-** both (B and C) are correct
- **5-**All of the following secrete a fluid that reduces (decreases) friction, **EXCEPT**: -
- **A-** pleura **B-** diaphragm **C-** the tissue that lines the surfaces of the knee joint **D-** pericardium
- **6-**.....is a molecule that initiates changes inside a cell in response to the binding of a specific substance to a receptor on the outside (surface) of a cell?
- **A-** first messenger. **B-** receptor protein. **C-** second messenger. **D-** hormone-receptor complex
- **7-**The motor division of the peripheral nervous system controls: -A- skeletal muscle movement
- **B-** regulating smooth muscles **C-** secretion of all of the body's hormones directly **D-** both (A and B) are correct
- **8-**Which of the following secretes estrogen? A- the mature egg B- corpus luteum C- growing umbilical cord
- 9-All of the following are bones of the appendicular skeleton, EXCEPT: -
- C- fibula A- clavicle **B-** sternum **D-** scapula
- **10**-Which of the following always presenting new antigens?
- **A-** rhinoviruses **B-** flu viruses

B- seminal vesicles

- **11-**Which of the following secretes testosterone?
 - **C-** prostate gland **D-** All of them are incorrect
- **12-**White blood cells are able to perform their function because:
- **A-** they are capable of secreting blood clotting enzymes. **B-** they are formed in the red bone marrow
- C- they can squeeze their way through openings in the walls of blood vessels into the intercellular fluid.
- **D-** their nucleus and organelles disappear

A- testis

- **13-**Which of the following blood vessels contains (transports) dark red blood?
- A- both superior and inferior vena cava B- Pulmonary veins C- Pulmonary artery D- both (A and C) are correct
- **14-**According to Mendel's experiments on pea plants, which of the following represents cross-pollination? **A-** Tt × Tt **B-** TT × tt C- TT × TT **D-** All of them are correct
- 15-The receptors that have tiny particles of calcium carbonate on top of them, are known as:-
- **A-** mechanoreceptors. **B-** pain receptors. **C-** chemoreceptors. **D-** photoreceptors
- **B-** diencephalon. **16**-Which part of the cerebrum interprets touch information? **A-** cerebral cortex
- **C-** midbrain. **D-** the part of the cerebrum that lies beneath the surface of the cerebral cortex 17-All of the following is correct regarding the pivot joint, EXCEPT: -
- **A-** it is a type of a movable joint.
 - **B-** it allows the body to bend and twist.
- **C-** it is found in the vertebral column. **D-** it is found in the axial skeleton

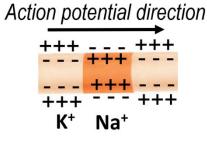
- **18-**Which of the following is **incorrect** regarding the cylinders in the structure of a long bone?
- **A-** contains vellow bone marrow.
- **B-** consists of lamellae.
- **C-** it is a part of the compact bone. **D-** In the center of each cylinder there is a Haversian canal
- **19-**Which of the following is a sequence of nucleotides in the template strand of a DNA molecule that is transcribed into a codon but then its not translated?
- **B-** ACT **A-**TAC C- ATC **D-** both (B and C) are correct
- **20-**The smooth muscle:
 - **A-** is found in the female reproductive tract.
- **B-** is arranged in opposing pairs.
- **C-** its muscle fibers are not surrounded by connective tissue. **D-** has both origin and insertion points
- **21-**The adjacent table shows the results of mixing several blood samples, which result in the following table is correct?

	Sample 1 (Donor)	Sample 2 (Recipient)	The result (the slide shape)		
Α	A -	A ⁺			
С	0-	AB+			

Sample 1 S (Donor) (R			The result (the slide shape)		
В	AB ⁻	O ⁺			
D	B-	AB ⁻			

22-The adjacent figure shows a part of the neuron axon, which of the following is correct regarding the movement of ions in their specific places on the figure across the neuron axon membrane?

	The movement of ions in their specific places on the figure across the neuron axon membrane				
Α	Sodium and potassium ions exit from the nerve cell				
В	Sodium and potassium ions enter the nerve cell				
С	Sodium ions exit from the nerve cell and potassium ions enter the nerve cell				
D	Sodium ions enter the nerve cell and potassium ions exit from the nerve cell				



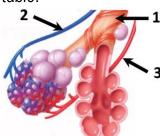
- **23-**In which principle of Koch's postulates principles, the pathogen is grown in the laboratory?
- **A-**1 and 3.
- **B-**2 and 4
- **C-**1 and 2.
- **D-**3 and 4.
- **24-**Natural killer cells differ from neutrophils in that natural killer cells: -
- **A-** are white blood cells.

- **B-** contribute to general defenses.
- **C-** attack pathogen-infected cells with the pathogen.
- **D-** Ingest pathogens
- 25-In Mendelian genetics, an allele (factor) is considered as a dominant if:
- **A-** able to express itself only in the homozygous state **B-** able to express itself only in the heterozygous state
- **C-** able to mask the effect of the other allele (factor) in the heterozygous state
- **D-** blending of two alleles occurs in the heterozygous state
- **26-**Which of the following is correct regarding the vas deference?
- **A-** it loops around the urethra.

- **B-** each normal male person has two
- **C-** transports semen to the urethra.
- **D-** all of them are correct
- **27-**All of the following occur in the fallopian tube, **EXCEPT**: -
- **A-** formation of morula **B-** formation of zygote
- **C-** meiosis II of the egg **D-** formation of first polar body
- 28-All of the following groups have a hormone that the site of secretion does not belong to them. EXCEPT: -
- **A-** insulin, prostaglandin, glucagon. **B-** oxytocin, epinephrine, antidiuretic hormone **C-** aldosterone, cortisol, glucagon
- **D-** thyroid stimulating hormone, adrenocorticotropic hormone, follicle-stimulating hormone
- **29-**vesicles fuse with the presynaptic membrane when?
- A- neurotransmitters are broken down by enzymes.
- **B-** an action potential reaches the axon terminal of the presynaptic neuron
- **C-** neurotransmitters are reabsorbed by a postsynaptic cell. **D-** the sodium-potassium pump is activated
- **30-**Which of the following defenses targets a specific type of pathogen?
- **A-**mucous membranes **B-**inflammatory response **C-**specific defenses **D-**temperature response

31-Based on the adjacent figure, choose the correct answer from the following table: -

	The blood in the blood vessel that is labeled by number 2: -	The blood in the blood vessel that is labeled by number 3: -	During exhalation the air in the structure that is labeled by number 1 passes into the: -	
Α	comes from the right ventricle	returns to the left atrium	alveoli	
В	returns to the left atrium comes from the right ventricle		bronchus	
С	comes from the right ventricle	returns to the left atrium	bronchus	
D	returns to the right ventricle comes from the left atrium alveoli		alveoli	



32-In which of the following crosses, the genotype ratio of homozygous and heterozygous is equal to 1:1: -**A-** monohybrid cross (heterozygous × heterozygous) **B-** monohybrid cross (heterozygous × heterozygous)

C- incomplete dominance (heterozygous × heterozygous) D- All of them are correct

33-In which of the following states the adrenaline is released? **A-**low blood glucose concentration **B-**when a person is stressed **C-**after the threat period has passed. **D-** both (A and B) are correct

34-During the first trimester:

A- primary germ layers do not form. **B-** the four embryonic membranes are not formed

C- the mother does not feel the movement of the fetus. **D-** the heart does not start beating

35-In an addict person after removing cocaine from the synapse and dopamine release returns to normal, the postsynaptic neuron: - **A**- is overstimulated **B**- is under stimulated

C- the number of receptor proteins on the postsynaptic cell decreases.

tsynaptic cell decreases. **D-** both (B and C) are correct

36-Rods differ from cones in that, rods: - A-are stimulated by bright light B- contain rhodopsin.
 C- initiate the production of sharp colors.
 D- respond to different colors

37-The secretory cells and target cells of which of the following hormones are part of the same organ?

A- secretin B- gastrin C- parathyroid D- calcitonin

38-Skeletal muscles:

A- are not attached to the periosteum.

B- are directly attached to the periosteum.

C- are attached to the periosteum by a tendon.

D- both (B and C) are correct

39-Antibodies bind to pathogens stopping their activity and destroying them: -

A- Indirectly by the specific defenses **B-** by preventing them from entering a cell, thereby blocking its reproduction.

C- by creating holes in the membranes of pathogen infected cells

D- All of them are correct

40-The two adjacent figures represent the results of the Hershey and Chase experiments,

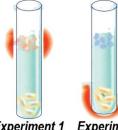
in which experiment they used ³⁵S and in which experiment they used ³²P?

A- In the first experiment they used ³⁵S, in the second experiment they used ³²P

B- in the first experiment they used ³²P, in the second experiment they used ³⁵S

C- in both experiments they used ³⁵S

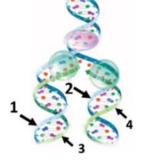
D- in both experiments they used ³²P



Experiment 1 Experiment 2

41- According to the adjacent figure that shows the process of DNA replication, after completing this process, which of the choices in the following table is correct regarding the ratio of pyrimidines and the ratio of purines?

	The ratio of pyrimidines in theis equal to the ratio of purines in the	The ratio of pyrimidines in theis <u>NOT EQUAL</u> to the ratio of purines in the		
Α	Strand 2 , strand 4	Strand 1 , strand 3		
В	Strand 1 , strand 4	Strand 2 , strand 4		
С	Strand 2 , strand 3	Strand 3 ,strand 4		
D	Strand 1 , strand 3	Strand 2 , strand 3		



42-Test cross determines the genotype of any individual who expresses the: -

A- dominant phenotype.

B- recessive phenotype

C- dominant phenotype and recessive phenotype

D- intermediate phenotype

43-The promoter differs from the start codon in that the promoter: -

A- is a specific nucleotide sequence of DNA.

B- DNA polymerase binds to it

C- indicates where translation should begin

D- both (A and B) are correct

44-According to the adjacent codon table, if this DNA sequence (CTCAAGTGCTTC) complements the strand that serves as a template to make mRNA, which of the following polypeptides is produced?

A- Leucine – Tyrosine –Arginine – Phenylalanine

B- Valine – Aspartic Acid – Proline – Histidine

C- Leucine – Lysine – Cysteine – Phenylalanine

D- Proline – Glutamic Acid – Leucine – valine

Codons in mRNA					
First base Second base			d base		Third base
U C		С	A	G	
U	Phenylalanine	Serine	Tyrosine	Cysteine	U
	Phenylalanine	Serine	Tyrosine	Cysteine	C
	Leucine	Serine	Stop	Stop	A
	Leucine	Serine	Stop	Tryptophan	G
С	Leucine	Proline	Histidine	Arginine	U
	Leucine	Proline	Histidine	Arginine	C
	Leucine	Proline	Glutamine	Arginine	A
	Leucine	Proline	Glutamine	Arginine	G
Α	Isoleucine	Threonine	Asparagine	Serine	U
	Isoleucine	Threonine	Asparagine	Serine	C
	Isoleucine	Threonine	Lysine	Arginine	A
	Methionine (start)	Threonine	Lysine	Arginine	G
G	Valine	Alanine	Aspartic acid	Glycine	U
	Valine	Alanine	Aspartic acid	Glycine	C
	Valine	Alanine	Glutamic acid	Glycine	A
	Valine	Alanine	Glutamic acid	Glycine	G

45-In a monohybrid cross, if half of the resulting offspring show the dominant trait, the genotype of the parents: -

A- both are heterozygous. **B-** one is heterozygous and the other is homozygous dominant

C- one is heterozygous and the other is recessive.

D- both are homozygous

46-At which step of translation does the last tRNA leave the ribosome?

A- elongation **B-** initiation

C- termination

D- disassembly

47-Which of the following is correct regarding the structure of a DNA molecule?

1.the number of sugar molecules is equal to the number of the phosphate group molecules.

2. each nucleotide can differ from another nucleotide only in the type of nitrogenous base. 3.the nitrogenous base is connected to the phosphate group directly by a covalent bond.

A-1, 2.

B- 1. 3

C- 2. 3

D- 1, 2, 3

48-In a dihybrid cross between two pea plants, one has short stem and axial flowers and the other is unknown for both traits, these ratios produced (1 short stem plant and axial flowers: 1 short stem plant and terminal flowers), which of the following represents the phenotype of the unknown plant:-

A- short stem and terminal flowers

B- tall stem and terminal flowers

C- short stem and axial flowers

D-tall stem and axial flowers

49-In the 28-day period of the ovarian and menstrual cycles, which of the following occurs one after the other (in sequence)? (1- Secretion of follicle-stimulating hormone, 2- Formation of corpus luteum, 3- Growth and development of the follicle, 4- Ovulation, 5- The sharp rise in the concentration of luteinizing hormone)

B-1 3 5 4 2 **D-1** 3 2 5 4

50-Which of the following is **incorrect** regarding the process of protein synthesis in eukaryotes?

A-by using the codon table, the codon GCU specifies the amino acid alanine in the genetic code of all living organisms

B- In the transcription, a part of one of the two DNA strands is used to transcribe tRNA

C- The translation can begin even before transcription has finished **D-** transcription takes place in the nucleus.