Kurdistan Region Government- Iraq
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

Fingerprint
A

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

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4-All of the following is correct regarding the pivot joint, **EXCEPT**: -
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6-All of the following are bones of the appendicular skeleton, **EXCEPT**: -
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A- they are capable of secreting blood clotting enzymes. **B-** they are formed in the red bone marrow
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11-The adjacent table shows the results of mixing several blood samples, which result in the following table is correct?

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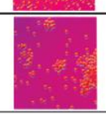
D	B^-	AB^-	

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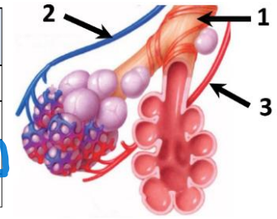

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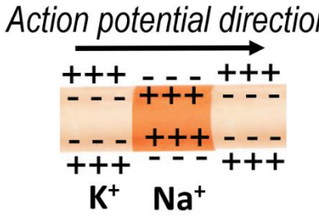

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29-All of the following groups have a hormone that the site of secretion **does not** belong to them, **EXCEPT**: -
A- insulin, prostaglandin, glucagon. **B-** oxytocin, epinephrine, antidiuretic hormone **C-** aldosterone, cortisol, glucagon
D- thyroid stimulating hormone, adrenocorticotropic hormone, follicle-stimulating hormone

30- *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- *Which of the following secretes testosterone?*
A- *testis* **B-** *seminal vesicles* **C-** *prostate gland* **D-** *All of them are incorrect*

32- *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*

33- *Which of the following secretes estrogen?*
A- *the mature egg* **B-** *corpus luteum* **C-** *growing umbilical cord* **D-** *All of them are correct*

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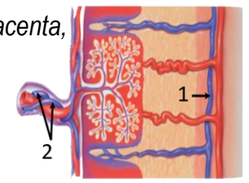

A- *numbers 1 and 2 point to maternal veins,*
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35- *During the first trimester:*
A- *primary germ layers do not form.* **B-** *the four embryonic membranes are not formed*
C- *the mother does not feel the movement of the fetus.* **D-** *the heart does not start beating*

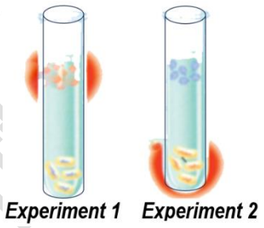
36- *In which of the following crosses, the genotype ratio of homozygous and heterozygous is equal to 1:1: -*
A- *monohybrid cross (heterozygous × heterozygous)* **B-** *monohybrid cross (heterozygous × heterozygous)*
C- *incomplete dominance (heterozygous × heterozygous)* **D-** *All of them are correct*

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- *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*

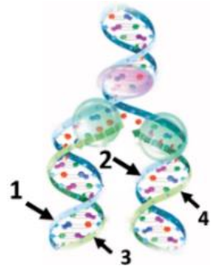
39- *Which of the following is a sequence of nucleotides in the template strand of a DNA molecule that is transcribed into a codon but then its not translated?*
A- *TAC* **B-** *ACT* **C-** *ATC* **D-** *both (B and C) are correct*

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*

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 the....is equal to the ratio of purines in the....	The ratio of pyrimidines in the....is NOT EQUAL to 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 3 , strand 4
D	Strand 1 , strand 3	Strand 2 , strand 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.* **B-** *DNA polymerase binds to it*
C- *indicates where translation should begin* **D-** *both (A and B) are correct*

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?*

Codons in mRNA

First base	Second base U	Second base C	Second base A	Second base G	Third base
U	Phenylalanine	Serine	Tyrosine	Cysteine	U
	Phenylalanine	Serine	Tyrosine	Cysteine	C
	Leucine	Serine	Stop	Stop	A
	Leucine	Serine	Stop	Tryptophan	G
C	Leucine	Proline	Histidine	Arginine	U
	Leucine	Proline	Histidine	Arginine	C
	Leucine	Proline	Glutamine	Arginine	A
	Leucine	Proline	Glutamine	Arginine	G
A	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

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

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- *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*

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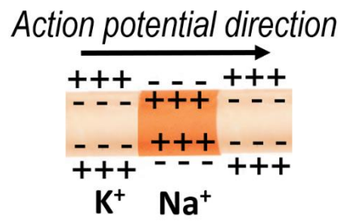

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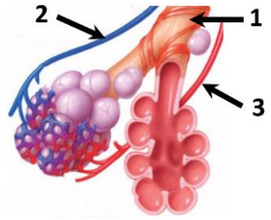

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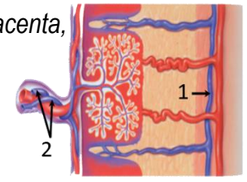

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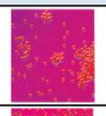
A	A^-	A^+	
C	O^-	AB^+	

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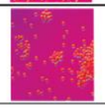
B	AB^-	O^+	
D	B^-	AB^-	

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

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
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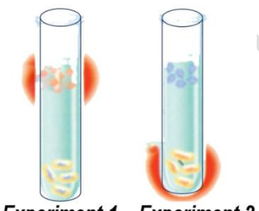

41- In a monohybrid cross, if half of the resulting offspring show the dominant trait, the genotype of the parents: -
A- both are heterozygous. **B-** one is heterozygous and the other is homozygous dominant
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42- In a dihybrid cross between two pea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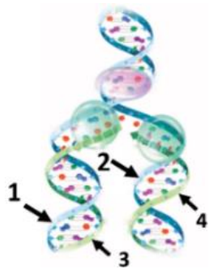

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C- Leucine – Lysine – Cysteine – Phenylalanine
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Codons in mRNA

First base	Second base U	Second base C	Second base A	Second base G	Third base
U	Phenylalanine	Serine	Tyrosine	Cysteine	U
	Phenylalanine	Serine	Tyrosine	Cysteine	C
	Leucine	Serine	Stop	Stop	A
	Leucine	Serine	Stop	Tryptophan	G
C	Leucine	Proline	Histidine	Arginine	U
	Leucine	Proline	Histidine	Arginine	C
	Leucine	Proline	Glutamine	Arginine	A
	Leucine	Proline	Glutamine	Arginine	G
A	Isoleucine	Threonine	Asparagine	Serine	U
	Isoleucine	Threonine	Asparagine	Serine	C
	Isoleucine	Threonine	Lysine	Arginine	A
	Methionine (start)	Threonine	Lysine	Arginine	G
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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)
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Kurdistan Region Government- Iraq
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

Fingerprint

C

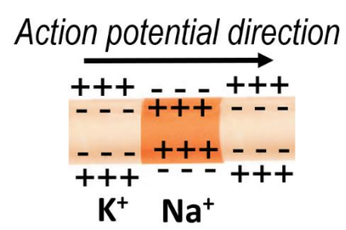
Note: choose the correct answer: - (2 marks for each right answer)

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
A	Sodium and potassium ions exit from 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

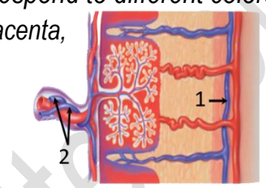


4- All of the following groups have a hormone that the site of secretion ***does not*** belong to them, ***EXCEPT***: -
A- insulin, prostaglandin, glucagon. **B-** oxytocin, epinephrine, antidiuretic hormone **C-** aldosterone, cortisol, glucagon
D- thyroid stimulating hormone, adrenocorticotropic hormone, follicle-stimulating hormone

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, 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

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

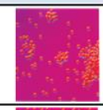
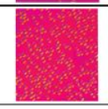
11- In which of the following crosses, the genotype ratio of homozygous and heterozygous is equal to 1:1: -
A- monohybrid cross (heterozygous × heterozygous) **B-** monohybrid cross (heterozygous × heterozygous)
C- incomplete dominance (heterozygous × heterozygous) **D-** All of them are correct

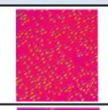
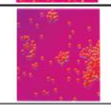
12- The tissue that forms the outer layer of blood vessels differs from the tissue that forms the inner layer of blood vessels in that the tissue that forms the outer layer of blood vessels -
A- its cells are characterized by cells that are embedded in large amounts of an intercellular substance
B- is 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)
A	A^-	A^+	
C	O^-	AB^+	

	Sample 1 (Donor)	Sample 2 (Recipient)	The result (the slide shape)
B	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?
A- Tt × Tt **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 **D-** scapula

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***: -
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

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 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- *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*

32- *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*

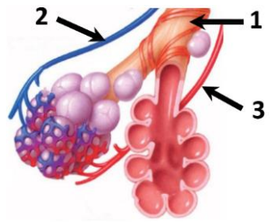
33- *Skeletal muscles:*
A- *are not attached to the periosteum.* **B-** *are directly attached to the periosteum.*
C- *are attached to the periosteum by a tendon.* **D-** *both (B and C) are correct*

34- *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*

35- *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*

36- *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: -
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
D	returns to the right ventricle	comes from the left atrium	alveoli



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

39- *Which of the following secretes testosterone?*
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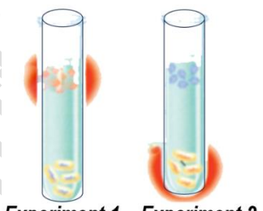

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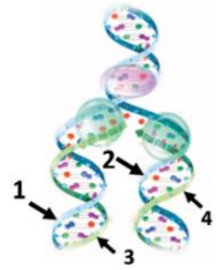

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Codons in mRNA

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Kurdistan Region Government- Iraq — In the Name of Allah — Subject: BIOLOGY
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General exams for preparatory stage (Scientific) — 12th Grade
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Fingerprint
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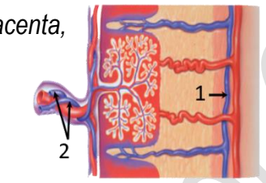

A- numbers 1 and 2 point to maternal veins,
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9-The secretory cells and target cells of which of the following hormones are part of the same organ?
A- secretin **B-** gastrin **C-** parathyroid **D-** calcitonin

10-Natural killer cells differ from neutrophils in that natural killer cells: -
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C- the number of receptor proteins on the postsynaptic cell decreases. **D-** both (B and C) are correct

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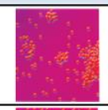
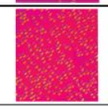
A	A^-	A^+	
C	O^-	AB^+	

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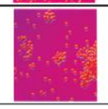
B	AB^-	O^+	
D	B^-	AB^-	

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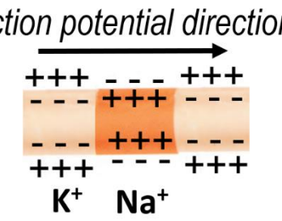

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	The blood in the blood vessel that is labeled by number 2: -	The blood in the blood vessel that is labeled by number 3: -	During exhalation the air in the structure that is labeled by number 1 passes into the: -
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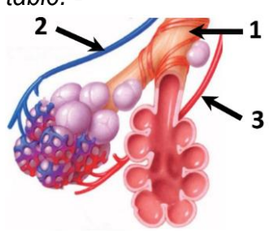

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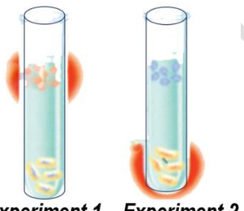
A- neurotransmitters are broken down by enzymes.
B- an action potential reaches the axon terminal of the presynaptic neuron
C- neurotransmitters are reabsorbed by a postsynaptic cell. **D-** the sodium-potassium pump is activated

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

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- 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- 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

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 in mRNA

First base	Second base U	Second base C	Second base A	Second base G	Third base
U	Phenylalanine	Serine	Tyrosine	Cysteine	U
	Phenylalanine	Serine	Tyrosine	Cysteine	C
	Leucine	Serine	Stop	Stop	A
	Leucine	Serine	Stop	Tryptophan	G
C	Leucine	Proline	Histidine	Arginine	U
	Leucine	Proline	Histidine	Arginine	C
	Leucine	Proline	Glutamine	Arginine	A
	Leucine	Proline	Glutamine	Arginine	G
A	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
C- one is heterozygous and the other is recessive. **D-** both are homozygous

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 the....is equal to the ratio of purines in the....	The ratio of pyrimidines in the....is NOT EQUAL to 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 3 , strand 4
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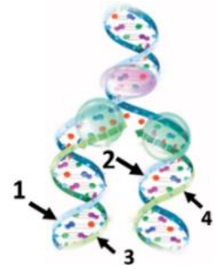

Kurdistan Region Government- Iraq | In the Name of Allah | Subject: BIOLOGY
Ministry of Education-High Committee of General Examinations | Time: 3.30 hours
General exams for preparatory stage (Scientific) | 12th Grade
For the academic year (2024-2025) Second Sitting

Fingerprint
E

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

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

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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

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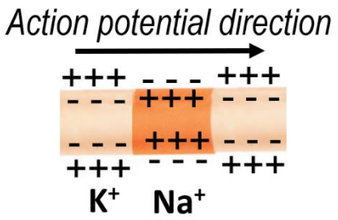

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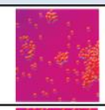
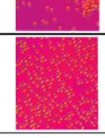
A	A^-	A^+	
C	O^-	AB^+	

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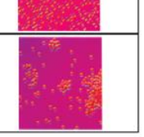
D	B^-	AB^-	

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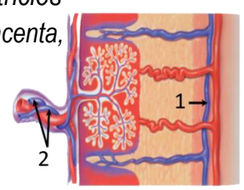

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C	*comes from the right ventricle*	*returns to the left atrium*	*bronchus*
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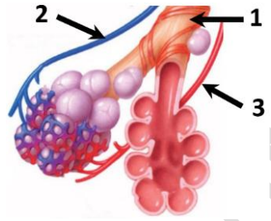

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A- *In the first experiment they used* ^{35}S*, in the second experiment they used* ^{32}P

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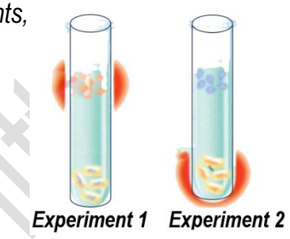

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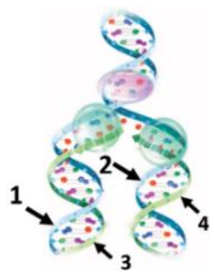

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A- *2 ➤ 1 ➤ 3 ➤ 5 ➤ 4* ***B-*** *1 ➤ 3 ➤ 5 ➤ 4 ➤ 2*

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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 U	Second base C	Second base A	Second base G	Third base
U	Phenylalanine	Serine	Tyrosine	Cysteine	U
	Phenylalanine	Serine	Tyrosine	Cysteine	C
	Leucine	Serine	Stop	Stop	A
	Leucine	Serine	Stop	Tryptophan	G
C	Leucine	Proline	Histidine	Arginine	U
	Leucine	Proline	Histidine	Arginine	C
	Leucine	Proline	Glutamine	Arginine	A
	Leucine	Proline	Glutamine	Arginine	G
A	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
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A- *short stem and terminal flowers* ***B-*** *tall stem and terminal flowers*

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

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

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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*

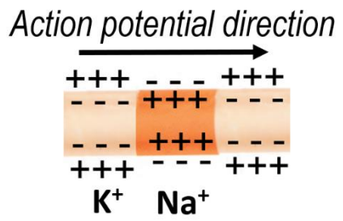
Kurdistan Region Government- Iraq — In the Name of Allah — Subject: BIOLOGY
Ministry of Education-High Committee of General Examinations — Time: 3.30 hours
General exams for preparatory stage (Scientific) — 12th Grade
For the academic year (2024-2025) Second Sitting

Fingerprint
F

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

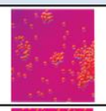
1-*The adjacent figure shows a part of the neuron axon, which of the following is correct regarding the movement of ions in their specific places on the figure across the neuron axon membrane?*

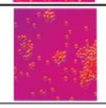
	The movement of ions in their specific places on the figure across the neuron axon membrane
A	Sodium and potassium ions exit from the nerve cell
B	Sodium and potassium ions enter the nerve cell
C	Sodium ions exit from the nerve cell and potassium ions enter the nerve cell
D	Sodium ions enter the nerve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



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

	Sample 1 (Donor)	Sample 2 (Recipient)	The result (the slide shape)
B	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?*
A- *the mature egg* **B-** *corpus luteum* **C-** *growing umbilical cord* **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?*
A- *Tt × Tt* **B-** *TT × tt* **C-** *TT × TT* **D-** *All of them are correct*

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

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: -*

	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: -
A	comes from the right ventricle	returns to the left atrium	alveoli
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C	comes from the right ventricle	returns to the left atrium	bronchus
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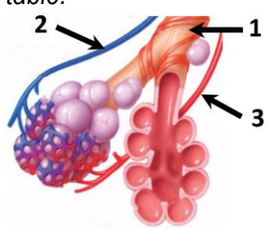
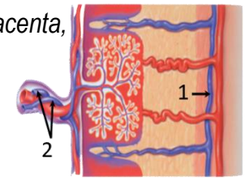


27-*Rods differ from cones in that, rods: -* **A-***are stimulated by bright light* **B-** *contain rhodopsin.*
C- *initiate the production of sharp colors.* **D-** *respond to different colors*

28- *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- *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*

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*

35- *…….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*

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,* ***EXCEPT****: -*
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.*

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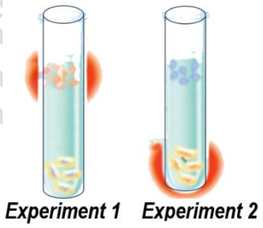

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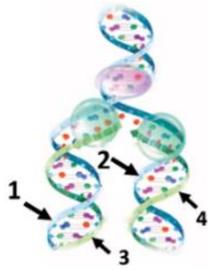

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Kurdistan Region Government- Iraq
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General exams for preparatory stage (Scientific)
For the academic year (2024-2025) Second Sitting

In the Name of Allah

Subject: BIOLOGY
Time: 3.30 hours
12th Grade

Fingerprint
G

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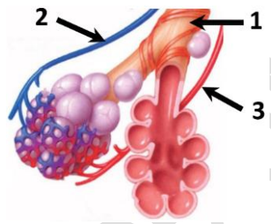

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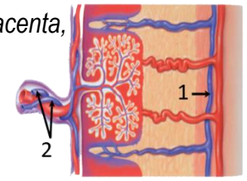

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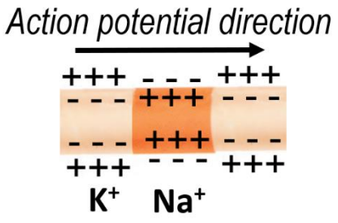

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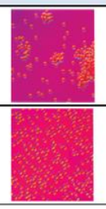
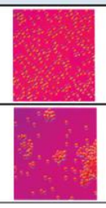
A	A^-	A^+	
C	O^-	AB^+	

	Sample 1 (Donor)	Sample 2 (Recipient)	The result (the slide shape)
B	AB^-	O^+	
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32- *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*

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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 ^{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*
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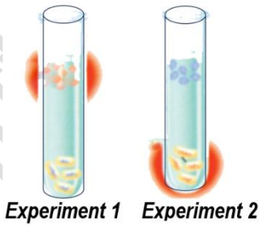


41- *In a monohybrid cross, if half of the resulting offspring show the dominant trait, the genotype of the parents: -*
A- *both are heterozygous.* **B-** *one is heterozygous and the other is homozygous dominant*
C- *one is heterozygous and the other is recessive.* **D-** *both are homozygous*

42- *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 U	Second base C	Second base A	Second base G	Third base
U	Phenylalanine	Serine	Tyrosine	Cysteine	U
	Phenylalanine	Serine	Tyrosine	Cysteine	C
	Leucine	Serine	Stop	Stop	A
	Leucine	Serine	Stop	Tryptophan	G
C	Leucine	Proline	Histidine	Arginine	U
	Leucine	Proline	Histidine	Arginine	C
	Leucine	Proline	Glutamine	Arginine	A
	Leucine	Proline	Glutamine	Arginine	G
A	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 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*

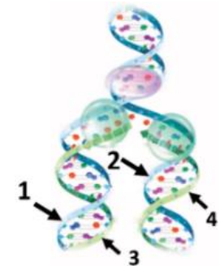
44- *Which of the following is correct regarding the structure of a DNA molecule?*
1.the number of sugar molecules is equal to the number of the phosphate group molecules.
2. each nucleotide can differ from another nucleotide only in the type of nitrogenous base.
3.the nitrogenous base is connected to the phosphate group directly by a covalent bond.
A- *1, 2.* **B-** *1, 3* **C-** *2, 3* **D-** *1, 2, 3*

45- *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* ***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 the....is equal to the ratio of purines in the....	The ratio of pyrimidines in the....is NOT EQUAL to 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 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* **B-** *1 ➤ 3 ➤ 5 ➤ 4 ➤ 2*
C- *3 ➤ 1 ➤ 2 ➤ 5 ➤ 4* **D-** *1 ➤ 3 ➤ 2 ➤ 5 ➤ 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*

Kurdistan Region Government- Iraq — In the Name of Allah — Subject: BIOLOGY
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Fingerprint
H

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

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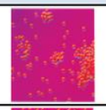
A	A^-	A^+	
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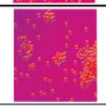
D	B^-	AB^-	

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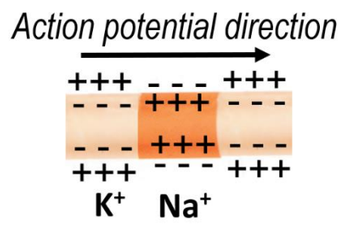

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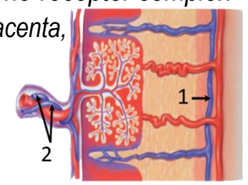

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A	comes from the right ventricle	returns to the left atrium	alveoli
B	returns to the left atrium	comes from the right ventricle	bronchus
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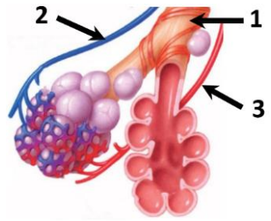

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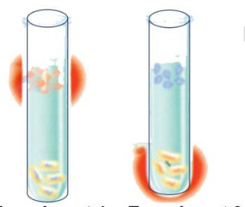

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41- *In a monohybrid cross, if half of the resulting offspring show the dominant trait, the genotype of the parents: -*
A- *both are heterozygous.* **B-** *one is heterozygous and the other is homozygous dominant*
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1.the number of sugar molecules is equal to the number of the phosphate group molecules.
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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:-*
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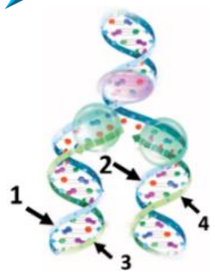
A- 2 ➤ 1 ➤ 3 ➤ 5 ➤ 4 **B-** 1 ➤ 3 ➤ 5 ➤ 4 ➤ 2
C- 3 ➤ 1 ➤ 2 ➤ 5 ➤ 4 **D-** 1 ➤ 3 ➤ 2 ➤ 5 ➤ 4

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?*



	The ratio of pyrimidines in the....is equal to the ratio of purines in the....	The ratio of pyrimidines in the....is NOT EQUAL to the ratio of purines in the....
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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 U	Second base C	Second base A	Second base G	Third base
U	Phenylalanine	Serine	Tyrosine	Cysteine	U
	Phenylalanine	Serine	Tyrosine	Cysteine	C
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	Leucine	Serine	Stop	Tryptophan	G
C	Leucine	Proline	Histidine	Arginine	U
	Leucine	Proline	Histidine	Arginine	C
	Leucine	Proline	Glutamine	Arginine	A
	Leucine	Proline	Glutamine	Arginine	G
A	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
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	Valine	Alanine	Glutamic acid	Glycine	A
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Kurdistan Region Government- Iraq
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

Fingerprint

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

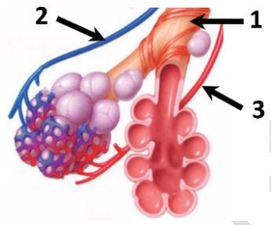
5- The motor division of the peripheral nervous system controls: - **A-** skeletal muscle movement
B- regulating smooth muscles **C-** secretion of all of the body's hormones directly **D-** both (A and B) are correct

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

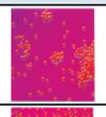
7- All of the following is correct regarding the pivot joint, ***EXCEPT***: -
A- it is a type of a movable joint. **B-** it allows the body to bend and twist.
C- it is found in the vertebral column. **D-** it is found in the axial skeleton

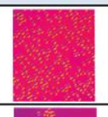
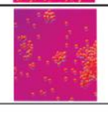
8- Based on the adjacent figure, choose the correct answer from the following table: -

	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: -
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
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?

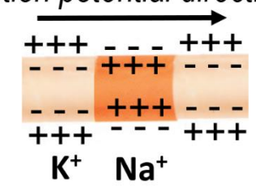
	Sample 1 (Donor)	Sample 2 (Recipient)	The result (the slide shape)
A	A^-	A^+	
C	O^-	AB^+	

	Sample 1 (Donor)	Sample 2 (Recipient)	The result (the slide shape)
B	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 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
A	Sodium and potassium ions exit from 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



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- 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

15- 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

16- 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

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 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, 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

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

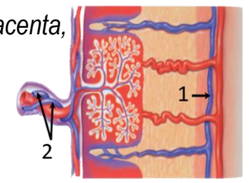
24- According to Mendel's experiments on pea plants, which of the following represents cross-pollination?
A- Tt × Tt **B-** TT × tt **C-** TT × TT **D-** All of them are correct

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

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- *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- *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*

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- *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*

33- *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*

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

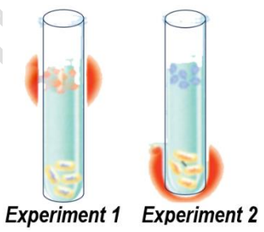
36- *All of the following are bones of the appendicular skeleton,* ***EXCEPT****: -*
A- *clavicle* **B-** *sternum* **C-** *fibula* **D-** *scapula*

37- *Which of the following always presenting new antigens?*
A- *rhinoviruses* **B-** *flu viruses* **C-** *HIV* **D-** *All of them are correct*

38- *Which of the following secretes testosterone?*
A- *testis* **B-** *seminal vesicles* **C-** *prostate gland* **D-** *All of them are incorrect*

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 ^{35}S and in which experiment they used ^{32}P?*



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Codons in mRNA

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	Leucine	Serine	Stop	Stop	A
	Leucine	Serine	Stop	Tryptophan	G
C	Leucine	Proline	Histidine	Arginine	U
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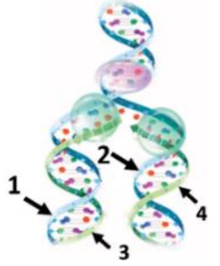

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Kurdistan Region Government- Iraq — In the Name of Allah — Subject: BIOLOGY
Ministry of Education-High Committee of General Examinations — Time: 3.30 hours
General exams for preparatory stage (Scientific) — 12th Grade
For the academic year (2024-2025) Second Sitting

Fingerprint
J

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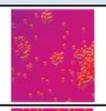
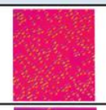
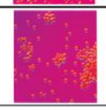
A	A^-	A^+	
C	O^-	AB^+	

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

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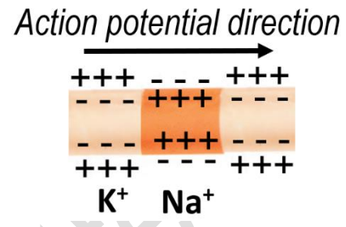

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	The blood in the blood vessel that is labeled by number 2: -	The blood in the blood vessel that is labeled by number 3: -	During exhalation the air in the structure that is labeled by number 1 passes into the: -
A	comes from the right ventricle	returns 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
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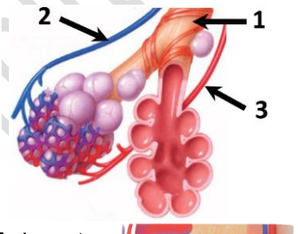

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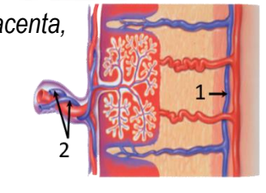

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A- monohybrid cross (heterozygous × heterozygous) **B-** monohybrid cross (heterozygous × heterozygous)
C- incomplete dominance (heterozygous × heterozygous) **D-** All of them are correct

22-Rods differ from cones in that, rods: - **A-**are stimulated by bright light **B-** contain rhodopsin.
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23-All of the following are bones of the appendicular skeleton, **EXCEPT**: -
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A- is found in the female reproductive tract. **B-** is arranged in opposing pairs.
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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

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

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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*

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

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

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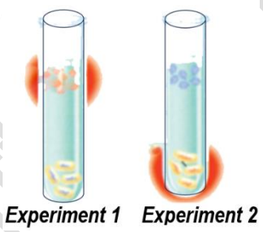


A- *In the first experiment they used ^{35}S, in the second experiment they used ^{32}P*
B- *in the first experiment they used ^{32}P, in the second experiment they used ^{35}S*
C- *in both experiments they used ^{35}S*
D- *in both experiments they used ^{32}P*

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* ***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- *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

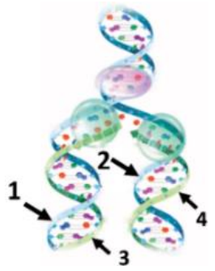
44- *Which of the following is correct regarding the structure of a DNA molecule?*
1.the number of sugar molecules is equal to the number of the phosphate group molecules.
2. each nucleotide can differ from another nucleotide only in the type of nitrogenous base.
3.the nitrogenous base is connected to 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 the....is equal to the ratio of purines in the....	The ratio of pyrimidines in the....is NOT EQUAL to 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 3 , strand 4
D	Strand 1 , strand 3	Strand 2 , strand 3

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*

Codons in mRNA

First base	Second base U	Second base C	Second base A	Second base G	Third base
U	Phenylalanine	Serine	Tyrosine	Cysteine	U
	Phenylalanine	Serine	Tyrosine	Cysteine	C
	Leucine	Serine	Stop	Stop	A
	Leucine	Serine	Stop	Tryptophan	G
C	Leucine	Proline	Histidine	Arginine	U
	Leucine	Proline	Histidine	Arginine	C
	Leucine	Proline	Glutamine	Arginine	A
	Leucine	Proline	Glutamine	Arginine	G
A	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

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- Iraq
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

Fingerprint
K

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

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A- it loops around the urethra. **B-** each normal male person has two
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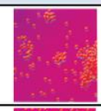
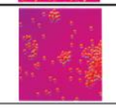
A	A^-	A^+	
B	AB^-	O^+	
C	O^-	AB^+	
D	B^-	AB^-	

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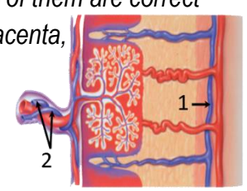

33- *The adjacent figure shows a part of the neuron axon, which of the following is correct regarding the movement of ions in their specific places on the figure across the neuron axon membrane?*

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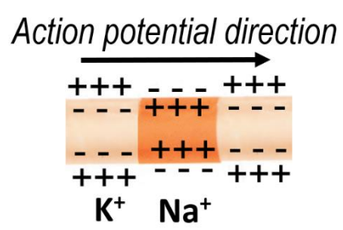

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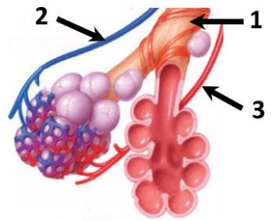

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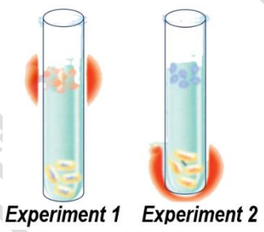

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42- *In the 28-day period of the ovarian and menstrual cycles, which of the following occurs one after the other (in sequence)? (1- Secretion of follicle-stimulating hormone, 2- Formation of corpus luteum, 3- Growth and development of the follicle,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

Codons in mRNA

First base	Second base U	Second base C	Second base A	Second base G	Third base
U	Phenylalanine	Serine	Tyrosine	Cysteine	U
	Phenylalanine	Serine	Tyrosine	Cysteine	C
	Leucine	Serine	Stop	Stop	A
	Leucine	Serine	Stop	Tryptophan	G
C	Leucine	Proline	Histidine	Arginine	U
	Leucine	Proline	Histidine	Arginine	C
	Leucine	Proline	Glutamine	Arginine	A
	Leucine	Proline	Glutamine	Arginine	G
A	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
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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 the....is equal to the ratio of purines in the....	The ratio of pyrimidines in the....is NOT EQUAL to the ratio of purines in the....
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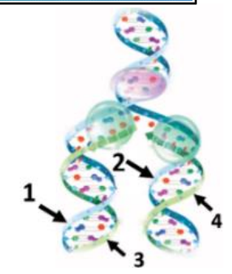

47- *In a dihybrid cross between two pea plants, one has short stem and axial flowers and the other is unknown for both traits, these ratios produced (1 short stem plant and axial flowers: 1 short stem plant and terminal flowers), which of the following represents the phenotype of the unknown plant:-*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

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In the Name of Allah

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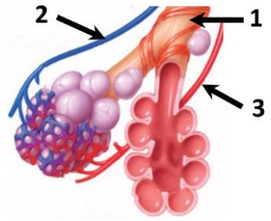
Note: choose the correct answer: - (2 marks for each right answer)

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: -
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
D	returns to the right ventricle	comes from the left atrium	alveoli



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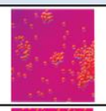
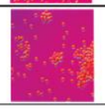
A	A^-	A^+	
C	O^-	AB^+	

	Sample 1 (Donor)	Sample 2 (Recipient)	The result (the slide shape)
B	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? **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

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?
A- the mature egg **B-** corpus luteum **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
A	Sodium and potassium ions exit from the nerve cell
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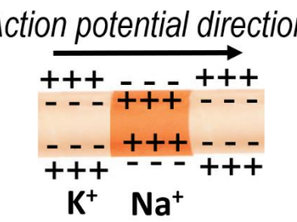

12- The secretory cells and target cells of which of the following hormones are part of the same organ?
A- secretin **B-** gastrin **C-** parathyroid **D-** calcitonin

13- 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- 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?
A- rhinoviruses **B-** flu viruses **C-** HIV **D-** All of them are correct

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- neurotransmitters 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. **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

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

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

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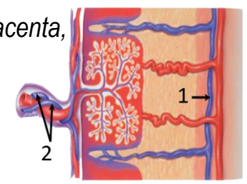


25- Which of the following is correct regarding the vas deference?
A- it loops around the urethra. **B-** each normal male person has two
C- transports semen to the urethra. **D-** all of them are correct

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

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- Tt × Tt **B-** TT × tt **C-** TT × TT **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

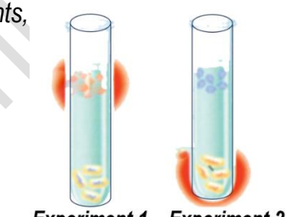
36-The smooth muscle:
A- is found in the female reproductive tract. **B-** is arranged in opposing pairs.
C- its muscle fibers are not surrounded by connective tissue. **D-** has both origin and insertion points

37-…….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

38-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

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 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?



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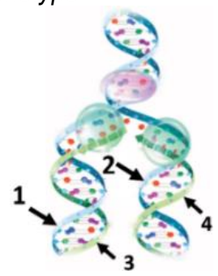

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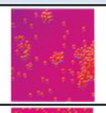
A	A^-	A^+	
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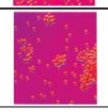
D	B^-	AB^-	

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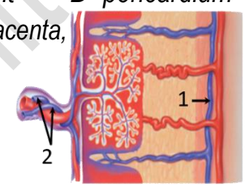

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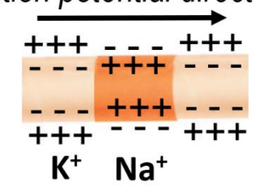

14-All of the following occur in the fallopian tube, **EXCEPT**: -
A- formation of morula **B-** formation of zygote **C-** meiosis II of the egg **D-** formation of first polar body

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-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: -
A	comes from the right ventricle	returns to the left atrium	alveoli
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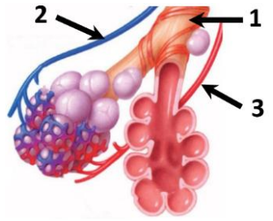

17-.....is a molecule that initiates changes inside a cell in response to the binding of a specific substance to a receptor on the outside (surface) of a cell?
A- first messenger. **B-** receptor protein. **C-** second messenger. **D-** hormone-receptor complex

18-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**: -
A- clavicle **B-** sternum **C-** fibula **D-** scapula

22-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

23-Antibodies bind to pathogens stopping their activity and destroying them: -
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24-Which of the following secretes testosterone?
A- testis **B-** seminal vesicles **C-** prostate gland **D-** All of them are incorrect

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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*

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39- *In Mendelian genetics, an allele (factor) is considered as a dominant if:*
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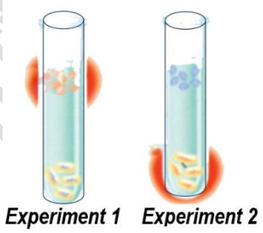
40- *The two adjacent figures represent the results of the Hershey and Chase experiments, in which experiment they used ^{35}S and in which experiment they used ^{32}P?*
A- *In the first experiment they used ^{35}S, in the second experiment they used ^{32}P*
B- *in the first experiment they used ^{32}P, in the second experiment they used ^{35}S*
C- *in both experiments they used ^{35}S*
D- *in both experiments they used ^{32}P*



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

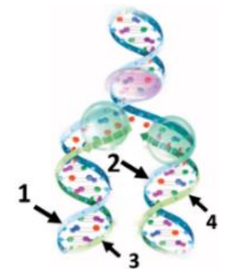
Codons in mRNA

First base	Second base U	Second base C	Second base A	Second base G	Third base
U	Phenylalanine	Serine	Tyrosine	Cysteine	U
	Phenylalanine	Serine	Tyrosine	Cysteine	C
	Leucine	Serine	Stop	Stop	A
	Leucine	Serine	Stop	Tryptophan	G
C	Leucine	Proline	Histidine	Arginine	U
	Leucine	Proline	Histidine	Arginine	C
	Leucine	Proline	Glutamine	Arginine	A
	Leucine	Proline	Glutamine	Arginine	G
A	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

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?*

	The ratio of pyrimidines in the....is equal to the ratio of purines in the....	The ratio of pyrimidines in the....is NOT EQUAL to 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 3 , strand 4
D	Strand 1 , strand 3	Strand 2 , strand 3



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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- Iraq — In the Name of Allah — Subject: BIOLOGY
Ministry of Education-High Committee of General Examinations — Time: 3.30 hours
General exams for preparatory stage (Scientific) — 12th Grade
For the academic year (2024-2025) Second Sitting

Fingerprint
N

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

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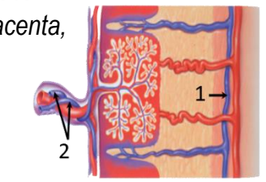
3-According to Mendel's experiments on pea plants, which of the following represents cross-pollination? **A-** Tt × Tt **B-** TT × tt **C-** TT × TT **D-** All of them are correct

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



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A- contains yellow bone marrow. **B-** consists of lamellae.
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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- neurotransmitters 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?
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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-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-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 **C-**HIV **D-** All of them are correct

14-Which of the following is correct regarding the diastole phase?
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B- It is represented by the P wave in the electrocardiograph (ECG).
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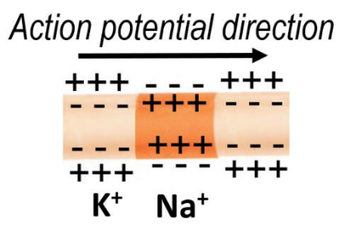
19-During the first trimester:
A- primary germ layers do not form. **B-** the four embryonic membranes are not formed
C- the mother does not feel the movement of the fetus. **D-** the heart does not start beating

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
A	Sodium and potassium ions exit from 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



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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: -
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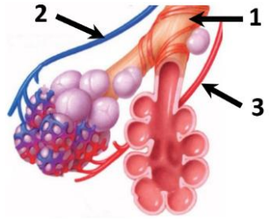

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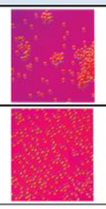
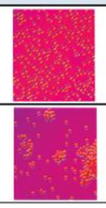
29- *The adjacent table shows the results of mixing several blood samples, which result in the following table is correct?*

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

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

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

31- *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*

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A- *protects the person from infecting with a new pathogen.* **B-** *memory cells are produced for the first time.*
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A- *testis* **B-** *seminal vesicles* **C-** *prostate gland* **D-** *All of them are incorrect*

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

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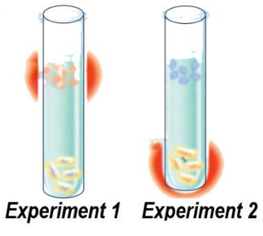

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Codons in mRNA

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	Leucine	Serine	Stop	Tryptophan	G
C	Leucine	Proline	Histidine	Arginine	U
	Leucine	Proline	Histidine	Arginine	C
	Leucine	Proline	Glutamine	Arginine	A
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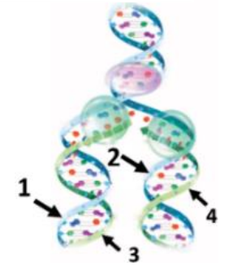
	Isoleucine	Threonine	Asparagine	Serine	C
	Isoleucine	Threonine	Lysine	Arginine	A
	Methionine (start)	Threonine	Lysine	Arginine	G
G	Valine	Alanine	Aspartic acid	Glycine	U
	Valine	Alanine	Aspartic acid	Glycine	C
	Valine	Alanine	Glutamic acid	Glycine	A
	Valine	Alanine	Glutamic acid	Glycine	G

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 the....is equal to the ratio of purines in the....	The ratio of pyrimidines in the....is NOT EQUAL to 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 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* **B-** *1 ➤ 3 ➤ 5 ➤ 4 ➤ 2*
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- Iraq
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

Fingerprint

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 **C-**HIV **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
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15-The adjacent table shows the results of mixing several blood samples, which result in the following table is correct?

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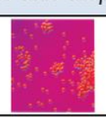
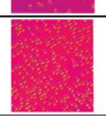
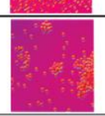
A	A^-	A^+	
C	O^-	AB^+	

	Sample 1 (Donor)	Sample 2 (Recipient)	The result (the slide shape)
B	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

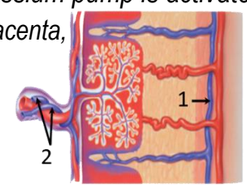
24-.....is a molecule that initiates changes inside a cell in response to the binding of a specific substance to a receptor on the outside (surface) of a cell?
A- first messenger. **B-** receptor protein. **C-** second messenger. **D-** hormone-receptor complex

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:-

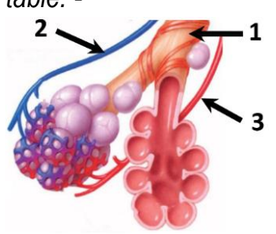


A- numbers 1 and 2 point to maternal veins,
B- numbers 1 and 2 point to maternal arteries,
C- number 1 points to an umbilical vein, and number 2 points a maternal vein
D- number 1 points to a maternal vein and the number 2 points to an umbilical artery

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: -
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
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*

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*

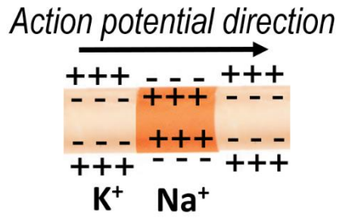
33- *All of the following are bones of the appendicular skeleton, **EXCEPT**: -*
A- *clavicle* **B-** *sternum* **C-** *fibula* **D-** *scapula*

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*

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*
C- *they can squeeze their way through openings in the walls of blood vessels into the intercellular fluid.*
D- *their nucleus and organelles disappear*

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?*

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

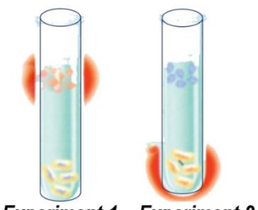


37- *Which of the following is a sequence of nucleotides in the template strand of a DNA molecule that is transcribed into a codon but then its not translated?*
A- *TAC* **B-** *ACT* **C-** *ATC* **D-** *both (B and C) are correct*

38- *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*

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 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*



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

	The ratio of pyrimidines in the....is equal to the ratio of purines in the....	The ratio of pyrimidines in the....is NOT EQUAL to the ratio of purines in the....
A	Strand 2 , strand 4	Strand 1 , strand 3
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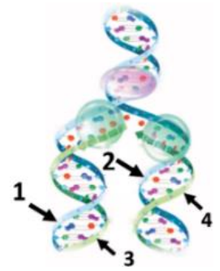

46- *According to the adjacent codon table, if this DNA sequence (CTCAAGTGCTTC) complements the strand that serves as a template to make mRNA, which of the following polypeptides is produced?*
A- *Leucine – Tyrosine –Arginine – Phenylalanine*
B- *Valine – Aspartic Acid – Proline – Histidine*
C- *Leucine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

Codons in mRNA

First base	Second base U	Second base C	Second base A	Second base G	Third base
U	Phenylalanine	Serine	Tyrosine	Cysteine	U
	Phenylalanine	Serine	Tyrosine	Cysteine	C
	Leucine	Serine	Stop	Stop	A
	Leucine	Serine	Stop	Tryptophan	G
C	Leucine	Proline	Histidine	Arginine	U
	Leucine	Proline	Histidine	Arginine	C
	Leucine	Proline	Glutamine	Arginine	A
	Leucine	Proline	Glutamine	Arginine	G
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	Valine	Alanine	Aspartic acid	Glycine	C
	Valine	Alanine	Glutamic acid	Glycine	A
	Valine	Alanine	Glutamic acid	Glycine	G

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.* **B-** *recessive 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*
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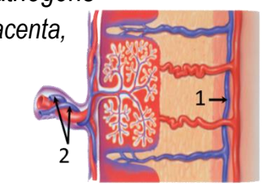

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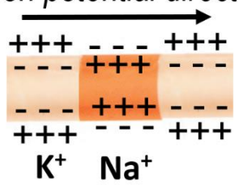
Action potential direction



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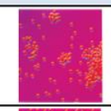
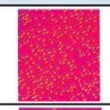
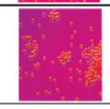
A	A^-	A^+	
C	O^-	AB^+	

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

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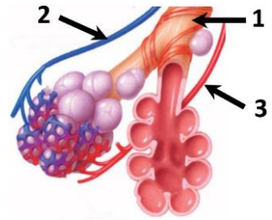
C	comes from the right ventricle	returns to the left atrium	bronchus
D	returns to the right ventricle	comes from the left atrium	alveoli



19-Skeletal muscles:
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20-In which of the following states the adrenaline is released? **A-**low blood glucose concentration
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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***: -
A- pleura **B-** diaphragm **C-** the tissue that lines the surfaces of the knee joint **D-** pericardium

23-Which of the following secretes testosterone?
A- testis **B-** seminal vesicles **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: -
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A- neurotransmitters are broken down by enzymes.
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C- neurotransmitters 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***: -
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

29-……..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

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
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32-The smooth muscle:
A- is found in the female reproductive tract. **B-** is arranged in opposing pairs.
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33-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

34-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

35-Which of the following is correct regarding the vas deference?
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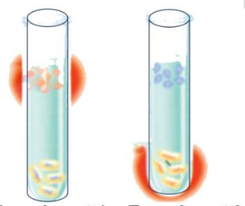
36-Which of the following defenses targets a specific type of pathogen?
A-mucous membranes **B-**inflammatory response **C-**specific defenses **D-**temperature response

37-Which of the following always presenting new antigens?
A- rhinoviruses **B-** flu viruses **C-**HIV **D-** All of them 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-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

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?

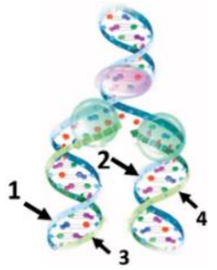


A- In the first experiment they used ^{35}S, in the second experiment they used ^{32}P
B- in the first experiment they used ^{32}P, in the second experiment they used ^{35}S
C- in both experiments they used ^{35}S
D- in both experiments they used ^{32}P

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-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- 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....	The ratio of pyrimidines in the....is NOT EQUAL to 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 3 , strand 4
D	Strand 1 , strand 3	Strand 2 , strand 3

44-At which step of translation does the last tRNA leave the ribosome?
A- elongation **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-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

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 in mRNA

First base	Second base U	Second base C	Second base A	Second base G	Third base
U	Phenylalanine	Serine	Tyrosine	Cysteine	U
	Phenylalanine	Serine	Tyrosine	Cysteine	C
	Leucine	Serine	Stop	Stop	A
	Leucine	Serine	Stop	Tryptophan	G
C	Leucine	Proline	Histidine	Arginine	U
	Leucine	Proline	Histidine	Arginine	C
	Leucine	Proline	Glutamine	Arginine	A
	Leucine	Proline	Glutamine	Arginine	G
A	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-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

Kurdistan Region Government- Iraq
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

Fingerprint

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

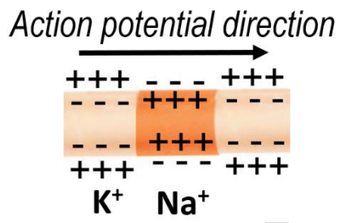
4- Rods differ from cones in that, rods: - **A-** are stimulated by bright light **B-** contain rhodopsin.
C- initiate the production of sharp colors. **D-** respond to different colors

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
A	Sodium and potassium ions exit from 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



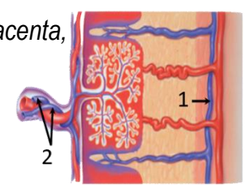
8- Which of the following is **incorrect** regarding the cylinders in the structure of a long bone?
A- contains yellow bone marrow. **B-** consists of lamellae.
C- it is a part of the compact bone. **D-** In the center of each cylinder there is a Haversian canal

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 **D-** scapula

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

16- During the first trimester:
A- primary germ layers do not form. **B-** the four embryonic membranes are not formed
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17- Which of the following is correct regarding the vas deference?
A- it loops around the urethra. **B-** each normal male person has two
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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)
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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?
A- 1 and 3. **B-** 2 and 4 **C-** 1 and 2. **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
B- is a connective tissue **C-** is an epithelial tissue **D-** both (A and B) are correct

22- Which of the following always presenting new antigens?
A- rhinoviruses **B-** flu viruses **C-** HIV **D-** All of them are correct

23- Which of the following secretes estrogen?
A- the mature egg **B-** corpus luteum **C-** growing umbilical cord **D-** All of them are correct

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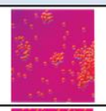
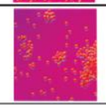
29- The receptors that have tiny particles of calcium carbonate on top of them, are known as:-
A- mechanoreceptors. **B-** pain receptors. **C-** chemoreceptors. **D-** photoreceptors

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. **B-** contribute to general defenses.
C- attack pathogen-infected cells with the pathogen. **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)
A	A^-	A^+	
C	O^-	AB^+	

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

33- *White blood cells are able to perform their function because:*
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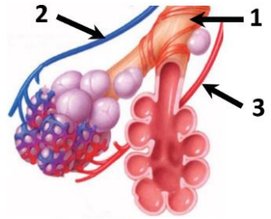
C- *they can squeeze their way through openings in the walls of blood vessels into the intercellular fluid.*
D- *their nucleus and organelles disappear*

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: -
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
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*

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

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A- *In the first experiment they used ^{35}S, in the second experiment they used ^{32}P*
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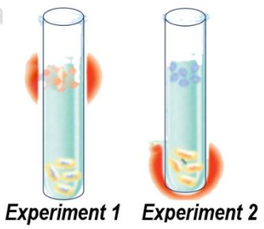

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A	Strand 2 , strand 4	Strand 1 , strand 3
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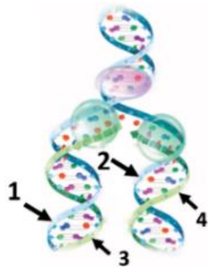
C	Strand 2 , strand 3	Strand 3 , strand 4
D	Strand 1 , strand 3	Strand 2 , strand 3



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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: -*
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C- *dominant phenotype and recessive phenotype* **D-** *intermediate phenotype*

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

Codons in mRNA

First base	Second base U	Second base C	Second base A	Second base G	Third base
U	Phenylalanine	Serine	Tyrosine	Cysteine	U
	Phenylalanine	Serine	Tyrosine	Cysteine	C
	Leucine	Serine	Stop	Stop	A
	Leucine	Serine	Stop	Tryptophan	G
C	Leucine	Proline	Histidine	Arginine	U
	Leucine	Proline	Histidine	Arginine	C
	Leucine	Proline	Glutamine	Arginine	A
	Leucine	Proline	Glutamine	Arginine	G
A	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

47- *At which step of translation does the last tRNA leave the ribosome?*
A- *elongation* **B-** *initiation* **C-** *termination* **D-** *disassembly*

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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)*
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- *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- Iraq
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

Fingerprint
R

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
A	Sodium and potassium ions exit from 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
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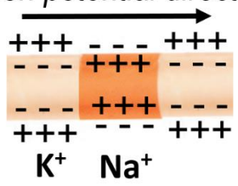
Action potential direction



2-Which of the following defenses targets a specific type of pathogen?
A-mucous membranes **B-**inflammatory response **C-**specific defenses **D-**temperature response

3-Which of the following secretes testosterone?
A- testis **B-** seminal vesicles **C-** prostate gland **D-** All of them are incorrect

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-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: -
A	comes from the right ventricle	returns to the left atrium	alveoli
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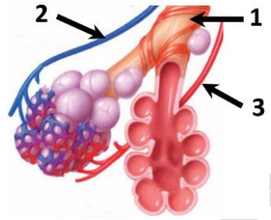

6-The receptors that have tiny particles of calcium carbonate on top of them, are known as:-
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9-Antibodies bind to pathogens stopping their activity and destroying them: -
A- Indirectly by the specific defenses **B-** by preventing them from entering 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 correct?

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

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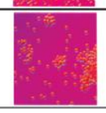
D	B^-	AB^-	

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-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 **C-**HIV **D-** All of them are correct

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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

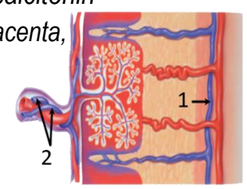
21-The smooth muscle:
A- is found in the female reproductive tract. **B-** is arranged in opposing pairs.
C- its muscle fibers are not surrounded by connective tissue. **D-** has both origin and insertion points

22-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

23-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

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

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

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- 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

32- 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

33- …….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

34- 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.

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. **D-** both (B and C) are correct

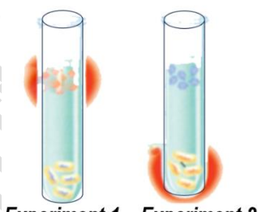
36- In Mendelian genetics, an allele (factor) is considered as a dominant if:
A- able to express itself only in the homozygous state **B-** able to express itself only in the heterozygous state
C- able to mask the effect of the other allele (factor) in the heterozygous state
D- blending of two alleles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

37- 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

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- 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

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



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- 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 U	Second base C	Second base A	Second base G	Third base
U	Phenylalanine	Serine	Tyrosine	Cysteine	U
	Phenylalanine	Serine	Tyrosine	Cysteine	C
	Leucine	Serine	Stop	Stop	A
	Leucine	Serine	Stop	Tryptophan	G
C	Leucine	Proline	Histidine	Arginine	U
	Leucine	Proline	Histidine	Arginine	C
	Leucine	Proline	Glutamine	Arginine	A
	Leucine	Proline	Glutamine	Arginine	G
A	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- 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 ➤ 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.
A- 1, 2. **B-** 1, 3 **C-** 2, 3 **D-** 1, 2, 3

46- 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

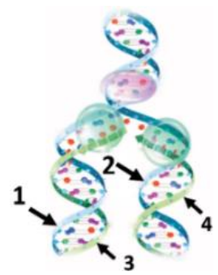
47- At which step of translation does the last tRNA leave the ribosome?
A- elongation **B-** initiation **C-** termination **D-** disassembly

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 the....is equal to the ratio of purines in the....	The ratio of pyrimidines in the....is NOT EQUAL to 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 3 , strand 4
D	Strand 1 , strand 3	Strand 2 , strand 3



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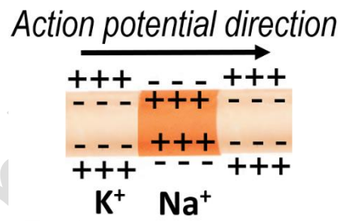

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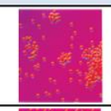
A	A^-	A^+	
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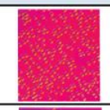
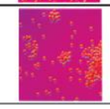
	Sample 1 (Donor)	Sample 2 (Recipient)	The result (the slide shape)
B	AB^-	O^+	
D	B^-	AB^-	

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	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: -
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B	returns to the left atrium	comes from the right ventricle	bronchus
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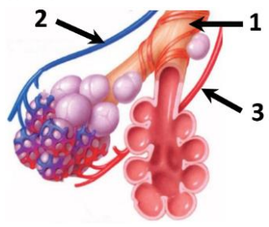

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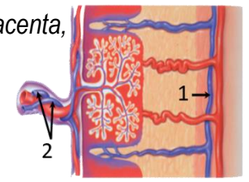

A- *numbers 1 and 2 point to maternal veins,*
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A- *monohybrid cross (heterozygous × heterozygous)* **B-** *monohybrid cross (heterozygous × heterozygous)*
C- *incomplete dominance (heterozygous × heterozygous)* **D-** *All of them are correct*

31- *Which of the following secretes estrogen?*
A- *the mature egg* **B-** *corpus luteum* **C-** *growing umbilical cord* **D-** *All of them are correct*

32- *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*

33- *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*

34- *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*

35- *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*

36- *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*

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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*

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

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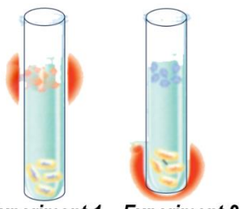
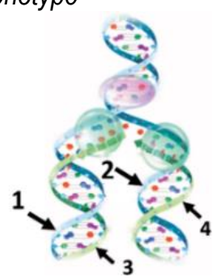


A- *In the first experiment they used ^{35}S, in the second experiment they used ^{32}P*
B- *in the first experiment they used ^{32}P, in the second experiment they used ^{35}S*
C- *in both experiments they used ^{35}S*
D- *in both experiments they used ^{32}P*

41- *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*

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 the....is equal to the ratio of purines in the....	The ratio of pyrimidines in the....is NOT EQUAL to 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 3 , strand 4
D	Strand 1 , strand 3	Strand 2 , strand 3

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?*

Codons in mRNA

First base	Second base U	Second base C	Second base A	Second base G	Third base
U	Phenylalanine	Serine	Tyrosine	Cysteine	U
	Phenylalanine	Serine	Tyrosine	Cysteine	C
	Leucine	Serine	Stop	Stop	A
	Leucine	Serine	Stop	Tryptophan	G
C	Leucine	Proline	Histidine	Arginine	U
	Leucine	Proline	Histidine	Arginine	C
	Leucine	Proline	Glutamine	Arginine	A
	Leucine	Proline	Glutamine	Arginine	G
A	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

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

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*

Kurdistan Region Government- Iraq
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

Fingerprint
T

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

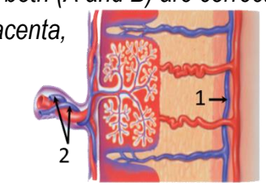
1-All of the following secrete a fluid that reduces(decreases) friction, ***EXCEPT***: -
A- pleura **B-** diaphragm **C-** the tissue that lines the surfaces of the knee joint **D-** pericardium

2-Natural killer cells differ from neutrophils in that natural killer cells: -
A- are white blood cells. **B-** contribute to general defenses.
C- attack pathogen-infected cells with the pathogen. **D-** Ingest pathogens

3-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

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-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
A	Sodium and potassium ions exit from the nerve cell
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C	Sodium ions exit from the nerve cell and potassium ions enter the nerve cell
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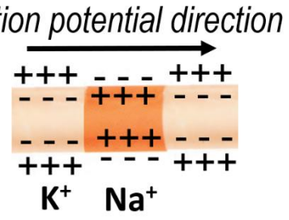


11-vesicles fuse with the presynaptic membrane when?
A- neurotransmitters are broken down by enzymes.
B- an action potential reaches the axon terminal of the presynaptic neuron
C- neurotransmitters are reabsorbed by a postsynaptic cell. **D-** the sodium-potassium pump is activated

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

15-All of the following are bones of the appendicular skeleton, ***EXCEPT***: -
A- clavicle **B-** sternum **C-** fibula **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?
A- testis **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?

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

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

19-Which of the following always presenting new antigens?
A- rhinoviruses **B-** flu viruses **C-**HIV **D-** All of them are correct

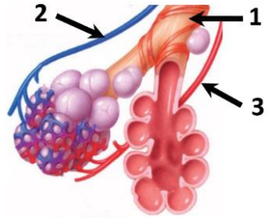
20-Which part of the cerebrum interprets touch information? **A-** cerebral cortex **B-** diencephalon.
C- midbrain. **D-** the part of the cerebrum that lies beneath the surface of the cerebral cortex

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

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

30- 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

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- 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

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

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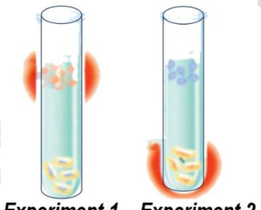

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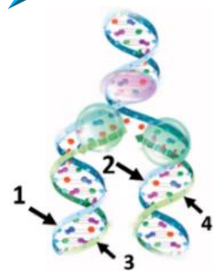

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A- Leucine – Tyrosine –Arginine – Phenylalanine
B- Valine – Aspartic Acid – Proline – Histidine
C- Leucine – Lysine – Cysteine – Phenylalanine
D- Proline – Glutamic Acid – Leucine – valine

Codons in mRNA

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	Leucine	Serine	Stop	Tryptophan	G
C	Leucine	Proline	Histidine	Arginine	U
	Leucine	Proline	Histidine	Arginine	C
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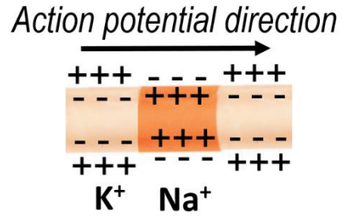

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15-Based on the adjacent figure, choose the correct answer from the following table: -

	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: -
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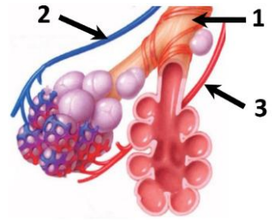

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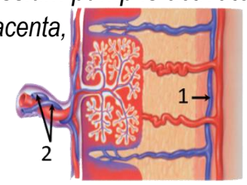

24-…….is a molecule that initiates changes inside a cell in response to the binding of a specific substance to a receptor on the outside (surface) of a cell?
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27-White blood cells are able to perform their function because:
A- they are capable of secreting blood clotting enzymes. **B-** they are formed in the red bone marrow
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28-In which of the following states the adrenaline is released? **A-**low blood glucose concentration
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A- Indirectly by the specific defenses **B-** by preventing them from entering a cell, thereby blocking its reproduction.
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30-All of the following are bones of the appendicular skeleton, ***EXCEPT***: -
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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*

32- *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*

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34- *Which of the following secretes estrogen?*

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

35- *The adjacent table shows the results of mixing several blood samples, which result in the following table is correct?*

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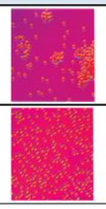
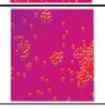
A	A^-	A^+	
C	O^-	AB^+	

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

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- *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*

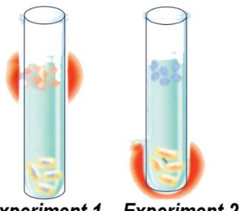
38- *During the first trimester:*

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*

39- *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*

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*

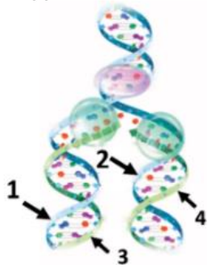
C- *in both experiments they used ^{35}S*

D- *in both experiments they used ^{32}P*

41- *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*

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 the....is equal to the ratio of purines in the....	The ratio of pyrimidines in the....is NOT EQUAL to 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 3 , strand 4
D	Strand 1 , strand 3	Strand 2 , strand 3

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 U	Second base C	Second base A	Second base G	Third base
U	Phenylalanine	Serine	Tyrosine	Cysteine	U
	Phenylalanine	Serine	Tyrosine	Cysteine	C
	Leucine	Serine	Stop	Stop	A
	Leucine	Serine	Stop	Tryptophan	G
C	Leucine	Proline	Histidine	Arginine	U
	Leucine	Proline	Histidine	Arginine	C
	Leucine	Proline	Glutamine	Arginine	A
	Leucine	Proline	Glutamine	Arginine	G
A	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- *At which step of translation does the last tRNA leave the ribosome?*

A- *elongation* **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*

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- *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*

Kurdistan Region Government- Iraq | In the Name of Allah | Subject: BIOLOGY
Ministry of Education-High Committee of General Examinations | Time: 3.30 hours
General exams for preparatory stage (Scientific) | 12th Grade
For the academic year (2024-2025) Second Sitting

Fingerprint
V

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

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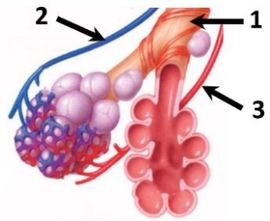

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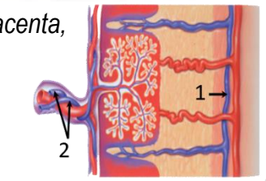

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7-The adjacent figure shows a part of the neuron axon, which of the following is correct regarding the movement of ions in their specific places on the figure across the neuron axon membrane?

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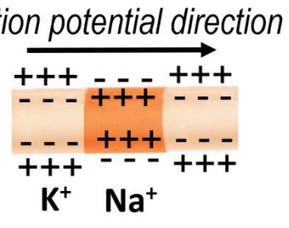

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9-All of the following occur in the fallopian tube, **EXCEPT**: -
A- formation of morula **B-** formation of zygote **C-** meiosis II of the egg **D-** formation of first polar body

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

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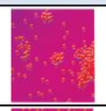
A	A^-	A^+	
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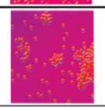
D	B^-	AB^-	

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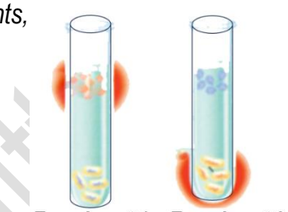

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A- Leucine – Tyrosine –Arginine – Phenylalanine
B- Valine – Aspartic Acid – Proline – Histidine
C- Leucine – Lysine – Cysteine – Phenylalanine
D- Proline – Glutamic Acid – Leucine – valine

Codons in mRNA

First base	Second base U	Second base C	Second base A	Second base G	Third base
U	Phenylalanine	Serine	Tyrosine	Cysteine	U
	Phenylalanine	Serine	Tyrosine	Cysteine	C
	Leucine	Serine	Stop	Stop	A
	Leucine	Serine	Stop	Tryptophan	G
C	Leucine	Proline	Histidine	Arginine	U
	Leucine	Proline	Histidine	Arginine	C
	Leucine	Proline	Glutamine	Arginine	A
	Leucine	Proline	Glutamine	Arginine	G
A	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
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44- Test cross determines the genotype of any individual who expresses the: -
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45- The promoter differs from the start codon in that the promoter: -
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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- 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 the....is equal to the ratio of purines in the....	The ratio of pyrimidines in the....is NOT EQUAL to the ratio of purines in the....
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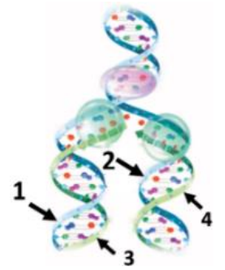

49- Which of the following is ***incorrect*** regarding the process of protein synthesis in eukaryotes?
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50- Which of the following is correct regarding the structure of a DNA molecule?
1.the number of sugar molecules is equal to the number of the phosphate group molecules.
2. each nucleotide can differ from another nucleotide only in the type of nitrogenous base.
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Kurdistan Region Government- Iraq
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

Fingerprint
W

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: -
A	comes from the right ventricle	returns to the left atrium	alveoli
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C	comes from the right ventricle	returns to the left atrium	bronchus
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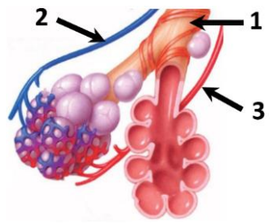


4-Which of the following is correct regarding the secondary immune response when a person is infected with the same pathogen for the second time?
A- protects the person from infecting with a new pathogen. **B-** memory cells are produced for the first time.
C- memory cells immediately recognize it and 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?
A- first messenger. **B-** receptor protein. **C-** second messenger. **D-** hormone-receptor complex

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

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

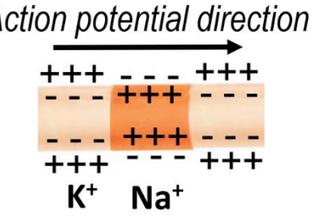
14-Rods differ from cones in that, rods: - **A-**are stimulated by bright light **B-** contain rhodopsin.
C- initiate the production of sharp colors. **D-** respond to different colors

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
A	Sodium and potassium ions exit from 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



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-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-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

21-Which of the following always presenting new antigens?
A- rhinoviruses **B-** flu viruses **C-**HIV **D-** All of them are correct

22-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

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
C- transports semen to the urethra. **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.
C- attack pathogen-infected cells with the pathogen. **D-** Ingest pathogens

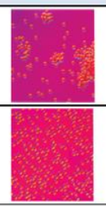
27-Which of the following is correct regarding the diastole phase?
A- The direction of blood movement is from the atria to the ventricles.
B- It is represented by the P wave in the electrocardiograph (ECG).
C- It takes longer than the atrial contraction phase. **D-** Blood flows to fill the ventricles

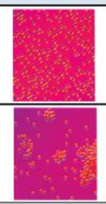
28-Skeletal muscles:
A- are not attached to the periosteum. **B-** are directly attached to the periosteum.
C- are attached to the periosteum by a tendon. **D-** both (B and C) are correct

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)
A	A^-	A^+	
C	O^-	AB^+	

	Sample 1 (Donor)	Sample 2 (Recipient)	The result (the slide shape)
B	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

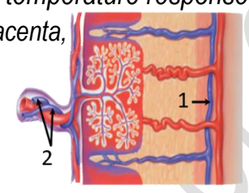
35- All of the following groups have a hormone that the site of secretion **does not** belong to them, **EXCEPT**: -
A- insulin, prostaglandin, glucagon. **B-** oxytocin, epinephrine, antidiuretic hormone **C-** aldosterone, cortisol, glucagon
D- thyroid stimulating hormone, adrenocorticotropic hormone, 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

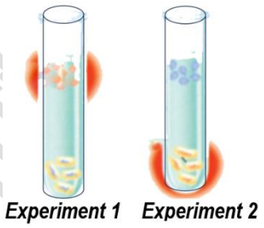
38- Which of the following defenses targets a specific type of pathogen?
A-mucous membranes **B-**inflammatory response **C-**specific defenses **D-**temperature response

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 ^{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
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41- Which of the following is **incorrect** regarding the process of protein synthesis in eukaryotes?
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Codons in mRNA

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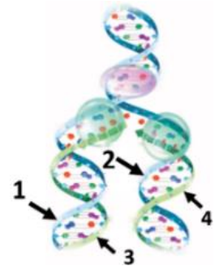

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48- In the 28-day period of the ovarian and menstrual cycles, which of the following occurs one after the other (in sequence)? (1- Secretion of follicle-stimulating hormone, 2- Formation of corpus luteum, 3- Growth and development of the follicle, 4- Ovulation, 5- The sharp rise in the concentration of luteinizing hormone)
A- 2 → 1 → 3 → 5 → 4 **B-** 1 → 3 → 5 → 4 → 2
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Kurdistan Region Government- Iraq — In the Name of Allah — Subject: BIOLOGY
Ministry of Education-High Committee of General Examinations — Time: 3.30 hours
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For the academic year (2024-2025) Second Sitting

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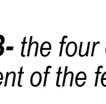
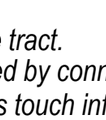
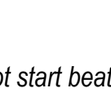
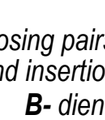
A	A^-	A^+	
C	O^-	AB^+	

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

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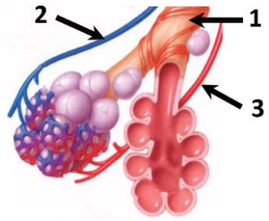
	The blood in the blood vessel that is labeled by number 2: -	The blood in the blood vessel that is labeled by number 3: -	During exhalation the air in the structure that is labeled by number 1 passes into the: -
A	comes from the right ventricle	returns to the left atrium	alveoli
B	returns to the left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



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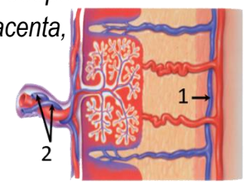

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A- The direction of blood movement is from the atria to the ventricles.
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24-White blood cells are able to perform their function because:
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C- are attached to the periosteum by a tendon. **D-** both (B and C) are correct

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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

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- *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
A	Sodium and potassium ions exit from the nerve cell
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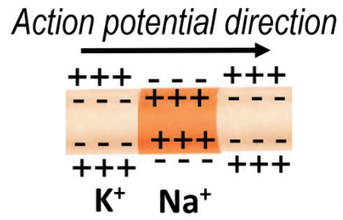

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A- *Tt × Tt* **B-** *TT × tt* **C-** *TT × TT* **D-** *All of them are correct*

35- *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*

36- *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 -*

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

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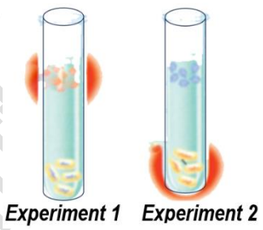

A- *In the first experiment they used ^{35}S, in the second experiment they used ^{32}P*

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*

41- *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*

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 U	Second base C	Second base A	Second base G	Third base
U	Phenylalanine	Serine	Tyrosine	Cysteine	U
	Phenylalanine	Serine	Tyrosine	Cysteine	C
	Leucine	Serine	Stop	Stop	A
	Leucine	Serine	Stop	Tryptophan	G
C	Leucine	Proline	Histidine	Arginine	U
	Leucine	Proline	Histidine	Arginine	C
	Leucine	Proline	Glutamine	Arginine	A
	Leucine	Proline	Glutamine	Arginine	G
A	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*

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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 ➤ 4* **B-** *1 ➤ 3 ➤ 5 ➤ 4 ➤ 2*

C- *3 ➤ 1 ➤ 2 ➤ 5 ➤ 4* **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*

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

A- *elongation* **B-** *initiation* **C-** *termination* **D-** *disassembly*

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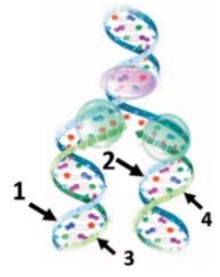

Kurdistan Region Government- Iraq
Ministry of Education-High Committee of General Examinations
General exams for preparatory stage (Scientific)
For the academic year (2024-2025) Second Sitting

In the Name of Allah

Subject: BIOLOGY
Time: 3.30 hours
12th Grade

Fingerprint
Y

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 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
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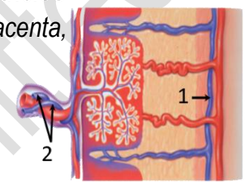

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12- In an addict person after removing cocaine from the synapse and dopamine release returns to normal, the postsynaptic neuron: - **A-** is overstimulated **B-** is under stimulated
C- the number of receptor proteins on the postsynaptic cell decreases.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

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: -
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
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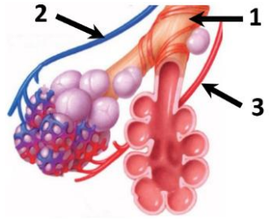

21- The secretory cells and target cells of which of the following hormones are part of the same organ?
A- secretin **B-** gastrin **C-** parathyroid **D-** calcitonin

22- All of the following secrete a fluid that reduces(decreases) friction, **EXCEPT**: -
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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)
A	A^-	A^+	
C	O^-	AB^+	

	Sample 1 (Donor)	Sample 2 (Recipient)	The result (the slide shape)
B	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.

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

31- 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

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35- …….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?
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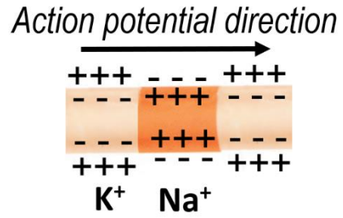

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B- regulating smooth muscles **C-** secretion of all of the body's hormones directly **D-** both (A and B) are correct

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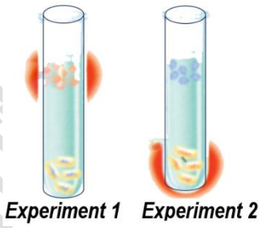

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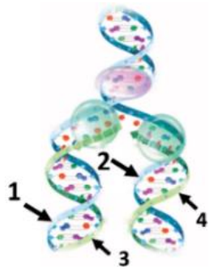

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Codons in mRNA

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	Phenylalanine	Serine	Tyrosine	Cysteine	C
	Leucine	Serine	Stop	Stop	A
	Leucine	Serine	Stop	Tryptophan	G
C	Leucine	Proline	Histidine	Arginine	U
	Leucine	Proline	Histidine	Arginine	C
	Leucine	Proline	Glutamine	Arginine	A
	Leucine	Proline	Glutamine	Arginine	G
A	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

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- Iraq
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

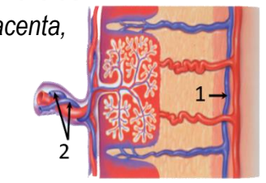
Fingerprint
Z

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- 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 **D-** All of them are correct

9- All of the following are bones of the appendicular skeleton, **EXCEPT**: -
A- clavicle **B-** sternum **C-** fibula **D-** scapula

10- Which of the following always presenting new antigens?
A- rhinoviruses **B-** flu viruses **C-** HIV **D-** All of them are correct

11- Which of the following secretes testosterone?
A- testis **B-** seminal vesicles **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

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

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

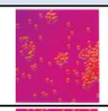
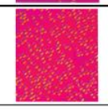
17- All of the following is correct regarding the pivot joint, **EXCEPT**: -
A- it is a type of a movable joint. **B-** it allows the body to bend and twist.
C- it is found in the vertebral column. **D-** it is found in the axial skeleton

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

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 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

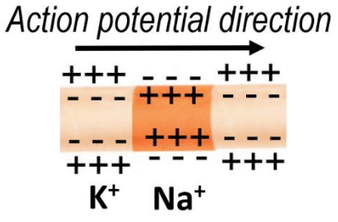
21- The adjacent table shows the results of mixing several blood samples, which result in the following table is correct?

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

	Sample 1 (Donor)	Sample 2 (Recipient)	The result (the slide shape)
B	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
A	Sodium and potassium ions exit from 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



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

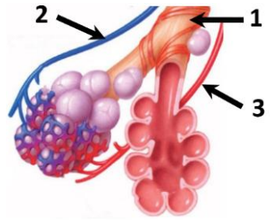
28- All of the following groups have a hormone that the site of secretion **does not** belong to them, **EXCEPT**: -
A- insulin, prostaglandin, glucagon. **B-** oxytocin, epinephrine, antidiuretic hormone **C-** aldosterone, cortisol, glucagon
D- thyroid stimulating hormone, adrenocorticotropic hormone, 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: -
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
D	returns to the right ventricle	comes from the left atrium	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.* **D-** *both (B and C) are correct*

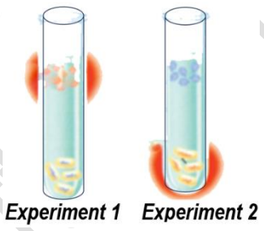
36- *Rods differ from cones in that, rods: -* **A-** *are stimulated by bright light* **B-** *contain rhodopsin.*
C- *initiate the production of sharp colors.* **D-** *respond to different colors*

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*

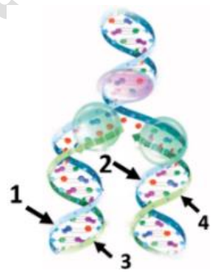
40- *The two adjacent figures represent the results of the Hershey and Chase experiments, in which experiment they used ^{35}S and in which experiment they used ^{32}P?*



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*

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 the....is equal to the ratio of purines in the....	The ratio of pyrimidines in the....is <u>NOT EQUAL</u> to 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 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 U	Second base C	Second base A	Second base G	Third base
U	Phenylalanine	Serine	Tyrosine	Cysteine	U
	Phenylalanine	Serine	Tyrosine	Cysteine	C
	Leucine	Serine	Stop	Stop	A
	Leucine	Serine	Stop	Tryptophan	G
C	Leucine	Proline	Histidine	Arginine	U
	Leucine	Proline	Histidine	Arginine	C
	Leucine	Proline	Glutamine	Arginine	A
	Leucine	Proline	Glutamine	Arginine	G
A	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)*
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 <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.*