



Note: choose the correct answer:

(2 marks for each right answer)

1-Which of the following tissues covers the parts of the bones that come in contact with each other, and protects the bones' surface from friction

- A- epithelial tissue B-connective tissue C-muscular tissue D-nervous tissue

2-In the structure of a long bone, several layers of protein fibers wrap around each Haversian canal. embedded within the gaps between the protein layers is (are):-

- A- osteocytes B- yellow bone marrow C- blood vessels D- nerves

3-The pivot joint differs from semimovable joints in that the pivot joint: -

- A- it allows to turn the head from side to side B- is found in the vertebral column  
C- it allows the body to bend and twist D- is found in the axial skeleton

4-All of the following are correct about the bones of the skull **EXCEPT**: -

- A- their cells are embedded in large amounts of an intercellular substance  
B- their cells are surrounded by a hard crystalline matrix  
C- All of them develop into hard bone after forming cartilage first D- there are fixed joints between them

5-Which of the following is **INCORRECT** about actin and myosin filaments in the skeletal muscle?

- A-thin actin filaments and thick myosin filaments are anchored at their endpoints to the Z line  
B-when the muscle contracts, the myosin filaments' heads bend inward, pulling the actin with them  
C-the overlapping pattern of these filaments gives the striated muscle tissue its striped appearance  
D-when the muscle contracts, the myosin filaments heads attach to points between the beads of the actin filaments

6-The skeletal muscle differs from the heart muscle and the smooth muscle in that the skeletal muscle: -

- A- is voluntary B- each cell of it contains many nuclei  
C- most of them are arranged in opposite pairs D- All of them are correct

7-When the left semilunar valve is defective the blood flows in the wrong direction, which compartment of the heart would receive blood?

- A- both atria B- both ventricles C- left ventricle only D- right ventricle only

8- The structure of the artery is similar to the structure of the vein in: -

- A- the thickness of their wall layers B- the presence of valves  
C- the sequence of the layers of their walls D-The amount of pressure on its walls

9-Which of the following happens in the phase that is represented by QRS on an electrocardiogram?

- A- the bicuspid and tricuspid valves open  
B- the blood is pumped from both ventricles to the aorta and the pulmonary artery  
C- blood flows from both atria into both ventricles D- The semilunar valves close

10-Red blood cells, white blood cells and platelets are similar in the

- A- site of formation B- shape C- size D- duration of life

11-X, Y and Z represent three individuals, if X donates blood to Z, the blood will agglutinate and if Y donates blood to Z, the blood also will agglutinate, but if X donates blood to Y, no agglutination will occur, Which option.in the adjacent table correctly represents the blood groups of the three individuals (X, Y and Z)?

	X	Y	Z
A	A <sup>+</sup>	B <sup>+</sup>	O <sup>-</sup>
B	A <sup>+</sup>	AB <sup>+</sup>	AB <sup>-</sup>
C	B <sup>-</sup>	A <sup>-</sup>	AB <sup>+</sup>
D	B <sup>+</sup>	O <sup>-</sup>	AB <sup>+</sup>

12-In the process of transporting carbon dioxide, carbonic acid in the lungs disassociates into: -

- A- carbon dioxide and water B- bicarbonate ions and hydrogen ions  
C- hydrogen ions and water D- bicarbonate ions and water

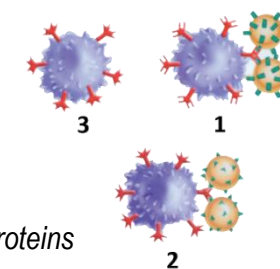
13-Which of the following makes the billions of new lymphocytes needed by the body every day?

- A- bone marrow inside long bones B- lymph nodes C- thymus gland D- spleen

14-Which of the following controls internal body conditions by regulating the smooth muscles of blood vessels?

- A- sensory division of the peripheral nervous system B- pons  
C- motor division of the peripheral nervous system D- corpus callosum

15-Based on the adjacent figure, which shows three different types of lymphocytes and two different types of antigens, why the lymphocyte that is indicated by number 3 cannot bind to any antigen?



- A- because the lymphocyte is a helper T cell  
B- because the structure of the protein receptors on the surface of the lymphocyte are not viral proteins  
C- because the protein receptors of the lymphocyte have complementary shape to two types of antigens  
D- due to the absence of a complementary shape antigens to the protein receptors on the surface of the lymphocyte

16-The macrophage secretes interleukin-1 when: - A- the macrophage binds to the cytotoxic T cell  
B- the receptor proteins on helper T cells bind to the viral antigens which the macrophage display them.  
C- the macrophage displays viral antigens on its surface D- the macrophage engulfs the virus

17-antigens that can trigger allergic reactions: -

- A- cause autoimmune diseases. B- include animal dander and dust mites  
C- cause an immune response in the general population. D- do not cause any immune response

18-In the first phase of HIV infection: -

- A- B cells cannot make antibodies against HIV B- the virus does not replicate and its number does not increase  
C- helper T cells cannot stimulate B cells and cytotoxic T cells. D- all of them are incorrect

19-The nodes of Ranvier are located along the length of: -

- A- the axon of all neurons. B- unmyelinated axons.  
C- the axons of neurons that are part of the brain or spinal cord only D- all of them are incorrect

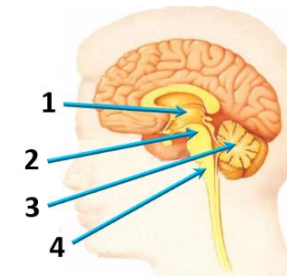
20-In the process of nerve impulse transmission at a synapse, the interaction of neurotransmitter and receptor molecules leads to:

- A- fusing of vesicles with the postsynaptic membrane.  
B- opening of ion channels at the presynaptic membrane.  
C- change in the permeability of the postsynaptic membrane  
D- change in the permeability of the presynaptic membrane

21- In the first principle of Koch's postulates, a comparison is made between:

- A- two healthy animals. B- an animal infected with a disease caused by a pathogen and a healthy animal.  
C- two animals, each infected with a disease from a different pathogen  
D- two animals infected with a disease caused by the same pathogen

22-According to the adjacent figure, which of the following serves as a control center for heart rate, respiration rate and other homeostatic activities



- A- 1, 3  
B- 4  
C- 2, 4  
D- 2

23-Pain receptors are stimulated by: -

- A- mechanical energy B- chemical energy C- thermal energy D- all of them are correct

24-The bending of hair cells in the organ of Corti is caused by their bending against (contact with):

- A-particles of calcium carbonate. B- bottom membrane of the middle chamber in the cochlea.  
C-the membrane which covers the hair cells D- both (B and C) are correct

25-Which of the following is considered an effect of cocaine on synapse?

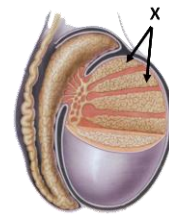
- A- stimulates the formation of dopamine in the presynaptic neuron  
B- blocks the reabsorption of dopamine in the synapse.  
C- stimulates the enzymes to break down dopamine in synapse  
D- prevents the entry of sodium ions into the postsynaptic neuron

26-Which of the following glands contains both exocrine cells and endocrine cells?

- A- adrenal glands B- thyroid gland C- pancreas D- pituitary gland

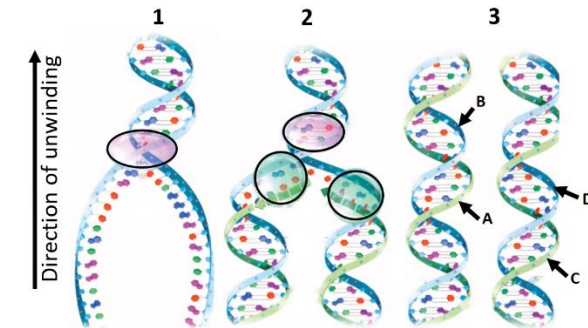


- 27-** Which of the following affects the dilation of the pupils?  
**A-** dim light    **B-** adrenal medulla    **C-** lens    **D-** both (A and B) are correct
- 28-** Why can thyroid hormones diffuse through cell membrane of their target cells?  
**A-** because they secreted by the endocrine system    **B-** because the body makes them from cholesterol  
**C-** because they are fat soluble    **D-** because they are made of a single modified amino acid
- 29-** Thyroxine and triiodothyronine:  
**A-** stimulate body cells, especially the muscles, to store glucose  
**B-** stimulate release of glucose into the bloodstream by liver cells  
**C-** promote the production of glucose from proteins  
**D-** stimulate enzymes that are associated with glucose oxidation and oxygen consumption
- 30-** Which of the following performs its function in the female reproductive system?  
**A-** the enzymes found in the tip of the sperm head region    **B-** the fluid secreted by the prostate gland  
**C-** the prostaglandin in the semen    **D-** all of them are correct
- 31-** In the adjacent figure, that shows the structure of the human testis, which of the following occurs in the structure indicated by the letter X?  
**A-** the sperm gains the ability to swim    **B-** mature sperm are stored in it  
**C-** sperm form through meiosis in the specialized cells lining them  
**D-** both (B and C) are correct
- 32-** Which of the following is correct about the luteal phase of the ovarian cycle?  
**A-** progesterone stimulates the growth of blood vessels in all layers of the uterus wall  
**B-** the high concentration of estrogen stimulates the pituitary gland to secrete luteinizing hormone  
**C-** the cells of the ruptured follicle grow and form the corpus luteum    **D-** both (A and C) are correct
- 33-** Cervix is the: -  
**A-** upper entrance to the uterus that connects to the fallopian tube  
**B-** lower entrance to the uterus that connects to the vagina  
**C-** upper entrance to the uterus that connects to the vagina  
**D-** lower entrance to the uterus that connects to the fallopian tube
- 34-** The yolk sac is formed during the: -  
**A-** first trimester of pregnancy    **B-** second trimester of pregnancy  
**C-** third trimester of pregnancy    **D-** formation of the egg
- 35-** Which of the following regarding implantation is true?  
**A-** the blastocyst burrows into the thickened lining of the uterus during implantation  
**B-** the implantation process occurs in the uterus  
**C-** the morula is produced through the process of implantation    **D-** both (A and B) are correct
- 36-** A cross between two tall stem pea plants results in 124 offspring 93 of them are tall and 31 of them are short plants, the probability that the homozygous plants will appear is:-  
**A-** 0 (Zero)    **B-**  $\frac{1}{4}$     **C-**  $\frac{1}{2}$     **D-**  $\frac{3}{4}$
- 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-** both (A and B) are correct
- 38-** A scientist performed a dihybrid cross between two pea plants of unknown genotypes, among the resulting offspring from this cross individual that are homozygous dominant of one trait and heterozygous of another trait appeared with a ratio of 25%, which of the following represents the genotypes of the two crossed plants?  
**A-** Ttaa × TtAa    **B-** TtAa × TtAa    **C-** TtAa × ttAa    **D-** TtAa × TtAa
- 39-** In test cross, the individual with an unknown genotype is heterozygous if the individuals resulting from this cross are likely to be: -  
**A-** all the same phenotype    **B-** of two different genotypes  
**C-** of two different phenotypes    **D-** both (B and C) are correct
- 40-** How many different phenotypes can be produced by a pair of codominant alleles?  
**A-** 1    **B-** 2    **C-** 3    **D-** 4
- 41-** By considering the three parts of a nucleotide, how many different nucleotides make up nucleic acids?  
**A-** 2    **B-** 4    **C-** 5    **D-** 8



- 42-** The phenotypic ratio is **NOT** equal to the genotype ratio of the offspring resulting from: -  
**A-** a cross between two heterozygous individuals in incomplete dominance  
**B-** a monohybrid cross between two heterozygous individuals in complete dominance  
**C-** a dihybrid cross between two homozygous individuals of both traits in complete dominance  
**D-** a cross between a homozygous individual with a heterozygous individual in incomplete dominance
- 43-** In the process of DNA replication..... separate(s) from.....  
**A-** purines, pyrimidines    **B-** sugar deoxyribose, nitrogenous bases  
**C-** sugar deoxyribose, phosphate group    **D-** phosphate group, nitrogenous bases

- 44-** According to the adjacent figure that shows the process of DNA replication, which of the following strands have the same sequence of nitrogenous bases? (B and D represent original strands)



- A-** A and D  
**B-** A and C  
**C-** B and D  
**D-** A and B

- 45-** Griffith's experiments determined all of the following **EXCEPT**:-

- A-** the genetic material is able to move from the heat-killed S cells to the live R cells  
**B-** the heat-killed S cells does not kill the mouse when injected with it  
**C-** the material that is transferred from the heat-killed S cells to the live R cells is DNA  
**D-** the live R cells can change and become deadly (lethal)

- 46-** All of the following are correct regarding the nitrogenous bases that have a double ring **EXCEPT**:-

- A-** include adenine and guanine    **B-** they are found in the structure of DNA and RNA  
**C-** carbon and nitrogen atoms are found in their structure  
**D-** always their number in a DNA strand is equal to single-ring nitrogenous bases in the same strand.

- 47-** Which of the following is a sequence of nucleotides in the template strand of a DNA molecule from which a stop codon is transcribed?    **A-** TAC    **B-** ACC    **C-** ATG    **D-** ATC

- 48-** The James Watson and Francis Crick final model was correct and remarkable because it explained how: -

- A-** DNA could replicate    **B-** RNA is transcribed from DNA  
**C-** mRNA is translated in cytoplasm    **D-** transcription takes place in the nucleus of eukaryotic cells

- 49-** Which of the following regarding the sequence of mRNA (AUG UUU GGG CUA GGG CUA UAA) is correct?

- A-** 4 different anticodons involved in its translation  
**B-** the polypeptide that is encoded by (produced from) it consists of 7 amino acids  
**C-** this sequence of mRNA consists of 7 nucleotides    **D-** All of its codons encode amino acids

- 50-** Use the anticodons given in the adjacent table to determine the sequence

of nitrogenous bases of the DNA strand that serves as a template for building

this polypeptide sequence (cysteine, leucine, proline, arginine, serine)

- A-** TCTAGAGGAACAGAA    **B-** AGGTCTGGTGATACA  
**C-** AGGCTTCCTAGAACA    **D-** TCCAGACCACTATGT

Reading direction				
Serine	Arginine	Proline	Leucine	Cysteine
AGG	UCU	GGU	GAU	ACA