BIOLOGY ENTRANCE EXAM QUESTIONS

FOR MEDICAL, DENTAL AND PHARMACY PROGRAMS

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2026

Medical University – Plovdiv

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Dear Applicants,

We are pleased to present this Biology Question Bank, designed to support your preparation for the entrance examinations in Medicine, Dental Medicine, and Pharmacy. The questions cover the key areas of biology required for a strong academic foundation, including cellular and molecular biology, biochemistry, genetics, microbiology, human anatomy and physiology. The structure of the Question Book follows the format of the examination and offers a variety of task types to help you develop accuracy, analytical thinking, and confidence.

We encourage you to use this resource as a self-assessment tool in parallel with the recommended textbooks. The general idea is to acquire knowledge not only by selecting the correct answers, but also by understanding the underlying biological concepts. Consistent practice and critical thinking are essential for success in medical education.

We wish you perseverance, strong motivation, and success in your preparation and in your future studies.

The Authors

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I. Choose the correct answer

*(Note: the right answers are given in **Bold**)*

Section A – Cell biology

1. The basic structural and functional unit of life is the:
   a) tissue b) organ
   c) **cell** d) molecule

2. The plasma membrane is composed of:
   a) proteins only b) carbohydrates only
   c) **lipids and proteins** d) lipids and salts

3. Ribosomes are the site of:
   a) lipid synthesis b) ATP synthesis
   c) **protein synthesis** d) DNA replication

4. Which of the following is a non-membrane bound organelle?
   a) the mitochondrion b) the lysosome
   c) the nucleus d) **the ribosome**

5. The Golgi apparatus mainly functions in:
   a) DNA replication
   b) protein synthesis
   c) **modification and packaging of proteins**
   d) respiration

6. Lysosomes contain:
   a) hormones b) DNA
   c) **hydrolytic enzymes** d) ribosomes

7. Mitochondria are called the powerhouse of the cell because they:
   a) store proteins b) control cell division
   c) **produce ATP** d) digest wastes

8. The inner folds of mitochondria are called:
   a) cisternae b) grana
   c) **cristae** d) stroma

9. The fluid inside mitochondria is called:
   a) cytosol b) stroma
   c) **matrix** d) nucleoplasm

10. The rough endoplasmic reticulum is rough due to the presence of:
    a) DNA
    b) enzymes
    c) **ribosomes**
    d) lipids

11. The smooth endoplasmic reticulum is mainly involved in:
    a) protein synthesis
    b) **lipid synthesis**
    c) ATP production
    d) ribosome formation

12. Which process(es) occur in the cell nucleus?
    a) DNA replication only
    b) DNA replication and translation
    c) **DNA replication and transcription**
    d) transcription only

13. The nucleolus is the site of:
    a) DNA replication
    b) **rRNA synthesis**
    c) lipid synthesis
    d) ATP production

14. The centrosome contains:
    a) chromosomes
    b) centromeres
    c) **centrioles**
    d) ribosomes

15. Centrioles are involved in:
    a) sister chromatid linkage
    b) protein synthesis
    c) **mitotic spindle formation**
    d) photosynthesis

16. Plastids are found in:
    a) animals
    b) fungi
    c) **plants**
    d) bacteria

17. Chloroplasts are responsible for:
    a) protein modifications
    b) digestion
    c) **photosynthesis**
    d) protein synthesis

18. The largest organelle in a plant cell is usually the:
    a) nucleus
    b) chloroplast
    c) mitochondrion
    d) **vacuole**

19. Plant vacuoles mainly function in:
    a) respiration
    b) **storage of nutrients and turgor maintenance**
    c) protein synthesis
    d) cell division

20. Peroxisomes are involved in:
    a) protein synthesis
    b) photosynthesis
    c) **detoxification**
    d) DNA replication

21. The plasma membrane is:
    a) fully permeable
    b) impermeable
    c) **selectively permeable**
    d) rigid

22. The fluid mosaic model explains the structure of the:
    a) nucleus
    b) mitochondria
    c) **cell membrane**
    d) ribosome

23. The cytoplasm consists of:
    a) DNA only
    b) **cytosol and organelles**
    c) only enzymes
    d) only ribosomes

24. Cilia and flagella are used for:
    a) secretion
    b) digestion
    c) **movement**
    d) respiration

25. Which of the following is not present inside the cell nucleus?
    a) nucleoli
    b) DNA
    c) chromatin
    d) **centrioles**

26. A cell wall is present in:
    a) animals only
    b) **plants, fungi, and bacteria**
    c) animals and plants
    d) fungi only

27. The main function of the cytoskeleton is:
    a) digestion
    b) respiration
    c) **structural support and transport**
    d) secretion

28. Microtubules are made of:
    a) actin
    b) **tubulin**
    c) myosin
    d) keratin

29. The nuclear membrane is:
    a) single-layered
    b) **double-layered**
    c) completely sealed
    d) discontinuous with the endoplasmic reticulum membrane

30. Nuclear pores are implicated in:
    a) DNA replication
    b) protein synthesis
    c) **exchange of substances between the nucleus and cytoplasm**
    d) mitotic spindle formation

31. The smallest cellular organelle is the:
    a) mitochondrion
    b) lysosome
    c) **ribosome**
    d) peroxisome

32. Lipid synthesis occurs in the:
    a) rough endoplasmic reticulum
    b) Golgi apparatus
    c) **smooth endoplasmic reticulum**
    d) nucleus

33. Which of the following is involved in spindle fiber formation?
    a) the Golgi apparatus
    b) the ribosome
    c) **the centrosome**
    d) the lysosome

34. The cell membrane contains:
    a) only lipids
    b) only proteins
    c) **lipids, proteins, and carbohydrates**
    d) only carbohydrates

35. Prokaryotic cells lack:
    a) ribosomes
    b) cytoplasm
    c) a cell membrane
    d) **a nucleus**

36. Prokaryotic DNA is usually:
    a) linear
    b) **circular**
    c) inside a nucleus
    d) inside mitochondria

37. Plasmids are:
    a) proteins
    b) organelles
    c) viruses
    d) **small circular DNA molecules**

38. The nucleoid of prokaryotes is a:
    a) true nucleus
    b) ribosome cluster
    c) **prokaryotic DNA**
    d) Golgi apparatus

39. Bacteria that are grouped in chains are called:
    a) Staphylococci
    b) Diplococci
    c) **Streptococci**
    d) Tetrads

40. Intracellular digestion takes place in:
    a) ribosomes
    b) mitochondria
    c) **lysosomes**
    d) the Golgi apparatus

41. The Golgi apparatus receives proteins mainly from the:
    a) nucleus
    b) smooth endoplasmic reticulum
    c) **rough endoplasmic reticulum**
    d) mitochondria

42. Which organelle has its own DNA?
    a) the lysosome
    b) the **mitochondrion**
    c) the Golgi apparatus
    d) the vacuole

43. Cristae increase the:
    a) volume of the chloroplasts
    b) **surface area for respiration**
    c) DNA content
    d) protein synthesis rate

44. Which of the following is present in plant cells but not in animal cells?
    a) mitochondria
    b) ribosomes
    c) a nucleus
    d) **a cell wall**

45. The main component of the plant cell wall is:
    a) chitin
    b) glycogen
    c) **cellulose**
    d) peptidoglycan

46. The cytosol is:
    a) spongy
    b) **gel-like**
    c) rigid
    d) watery

47. Synthesis of membrane and secretory proteins takes place in the:
    a) smooth endoplasmic reticulum
    b) rough endoplasmic reticulum
    c) Golgi apparatus
    d) cytosol

48. Packaging of lipids and proteins for extracellular transport is the major function of the:
    a) ribosome
    b) mitochondrion
    c) **Golgi apparatus**
    d) centriole

49. Plant cell division occurs through:
    a) binary fission
    b) budding
    c) **mitosis**
    d) conjugation

50. Oxidase enzymes are abundant in:
    a) lysosomes b) chloroplast
    c) **peroxisomes** d) the Golgi apparatus

51. Prokaryotic and eukaryotic cells both contain:
    a) a cell nucleus b) mitochondria
    c) **ribosomes** d) Golgi apparatus

52. The main function of mitochondria is:
    a) digestion b) storage
    c) **energy production** d) secretion

53. Which organelle is called the "suicide bag" of the cell?
    a) the peroxisome b) **the lysosome**
    c) the ribosome d) the vacuole

54. The endoplasmatic reticulum and Golgi together form the:
    a) digestive system b) **endomembrane system**
    c) cytoskeleton d) nucleoid system

55. Cell shape is maintained by the:
    a) nucleus b) **cytoskeleton**
    c) ribosome d) Golgi apparatus

56. Which organelle is absent in mature mammalian red blood cells?
    a) ribosome b) mitochondria
    c) **nucleus** d) cell membrane

57. The site of ribosome formation is the:
    a) nucleus b) **nucleolus**
    c) mitochondrion d) Golgi apparatus

58. The outer boundary of animal cells is the:
    a) cell wall b) **plasma membrane**
    c) tonoplast d) capsule

59. Which of the following is involved in detoxification in liver cells?
    a) mitotic spindle b) the ribosome
    c) **endoplasmic reticulum** d) the nucleus

60. Light-dependent reactions in chloroplasts occur in the:
    a) outer membrane b) inner membrane
    c) **thylakoid membrane** d) stroma

Section B – Biochemistry and molecular biology

1. The basic building blocks (monomers) of proteins are:
   a) fatty acids b) nucleotides
   c) monosaccharides d) **amino acids**

2. Amino acids are linked by a:
   a) hydrogen bond b) ionic bond
   c) **peptide bond** d) glycosidic bond

3. The most abundant organic molecule(s) in cells is/are:
   a) water b) DNA
   c) **proteins** d) lipids

4. The primary structure of a protein depends on the:
   a) folding of the chain b) **sequence of amino acids**
   c) number of hydrogen bonds d) overall shape

5. Globular proteins are usually:
   a) insoluble in water b) structural proteins only
   c) **soluble in water** d) fibrous

6. Most enzymes are:
   a) lipids b) carbohydrates
   c) nucleic acids d) **proteins**

7. The monomer of carbohydrates is the:
   a) amino acid b) nucleotide
   c) fatty acid d) **monosaccharide**

8. Starch is a polymer of:
   a) fructose b) sucrose
   c) **glucose** d) lactose

9. Glycogen is mainly stored in the:
   a) lungs and heart b) brain and kidney
   c) **liver and muscles** d) skin and bones

10. Cellulose is found in:
    a) animals b) fungi
    c) **plants** d) bacteria

11. The monomers of nucleic acids are:
    a) amino acids
    b) fatty acids
    c) lipids
    d) **nucleotides**

12. DNA contains the sugar:
    a) ribose
    b) fructose
    c) sucrose
    d) **deoxyribose**

13. RNA contains the sugar:
    a) deoxyribose
    b) fructose
    c) glucose
    d) **ribose**

14. The nitrogenous bases in DNA are:
    a) A U G C
    b) A T U C
    c) G C U T
    d) **A T G C**

15. Which nitrogenous base is not found in DNA?
    a) adenine
    b) thymine
    c) cytosine
    d) **uracil**

16. DNA is usually:
    a) single-stranded
    b) circular in eukaryotes
    c) linear in prokaryotes
    d) **double-stranded**

17. In cells, RNA is typically:
    a) double-stranded
    b) found only in the nucleus
    c) the genetic material
    d) **single-stranded**

18. The hydrogen bonds in DNA form between the:
    a) sugar and the phosphate group
    b) phosphate and hydroxyl groups
    c) **nitrogenous bases**
    d) ribose and the base

19. In DNA, adenine pairs with:
    a) guanine
    b) cytosine
    c) **thymine**
    d) uracil

20. Which bonds form the backbone of DNA?
    a) hydrogen
    b) N-glycosidic
    c) **phosphodiester**
    d) Van der Waals

21. Replication is the synthesis of:
    a) cells
    b) protein
    c) **DNA**
    d) lipid

22. Transcription is the synthesis of:
    a) DNA
    b) proteins
    c) **RNA**
    d) lipids

23. Translation is the synthesis of:
    a) DNA
    b) RNA
    c) **proteins**
    d) carbohydrates

24. The genetic information is stored mainly in:
    a) proteins
    b) lipids
    c) carbohydrates
    d) **DNA**

25. mRNA carries:
    a) amino acids
    b) ribosomes
    c) enzymes
    d) **genetic information**

26. tRNA carries:
    a) DNA
    b) ATP
    c) ribosomes
    d) **amino acids**

27. rRNA is the major component of:
    a) chromosomes
    b) the nucleus
    c) the Golgi apparatus
    d) **ribosomes**

28. How many nitrogenous bases make up a codon?
    a) one
    b) two
    c) **three**
    d) four

29. One codon codes for one:
    a) gene
    b) protein
    c) rRNA
    d) **amino acid**

30. During DNA replication, DNA polymerase adds nucleotides to the growing strand at the:
    a) P end
    b) **OH end**
    c) origin of replication
    d) hydrogen bonds between bases

31. DNA polymerase is used in:
    a) repair only
    b) replication and transcription
    c) **replication**
    d) transcription

32. RNA polymerase is used in:
    a) replication
    b) **transcription**
    c) translation
    d) DNA repair

33. A polysome is:
    a) a cluster of DNA molecules
    b) a cluster of RNA molecules
    c) multiple ribosomes on one DNA
    d) **multiple ribosomes on one mRNA**

34. Which of the following best describes the central dogma of molecular biology?
    a) RNA → DNA → protein
    b) protein → DNA → RNA
    c) DNA → protein → RNA
    d) **DNA → RNA → protein**

35. The lagging strand during DNA replication is characterized by:
    a) continuous synthesis
    b) **synthesis in short fragments**
    c) OH → P synthesis
    d) synthesis by helicase

36. A gene is a:
    a) whole chromosome
    b) protein
    c) ribosome
    d) **segment of DNA**

37. The part of DNA that codes for a protein is called:
    a) chromosome
    b) codon
    c) intron
    d) **gene**

38. Transcription is the process by which:
    a) DNA is replicated
    b) **RNA is synthesized from a DNA template**
    c) proteins are synthesized from RNA
    d) ribosomes are assembled

39. During translation, the anticodon is found on the:
    a) mRNA
    b) rRNA
    c) **tRNA**
    d) DNA

40. The genetic code is:
    a) overlapping and variable
    b) doublet and incomplete
    c) species-specific and overlapping
    d) **universal and triplet**

41. Lipids are generally:
    a) hydrophilic
    b) water-soluble
    c) polymers
    d) **hydrophobic**

42. Lipids primarily serve as:
    a) **structural components of membranes and energy storage**
    b) enzymes for metabolic reactions
    c) genetic material
    d) water-soluble vitamins

43. Phospholipids form:
    a) DNA
    b) enzymes
    c) ribosomes
    d) **cell membranes**

44. Steroids are:
    a) proteins
    b) carbohydrates
    c) nucleic acids
    d) **lipids**

45. Cholesterol is a type of:
    a) protein
    b) carbohydrate
    c) vitamin
    d) **steroid**

46. ATP is best described as:
    a) an enzyme
    b) a protein
    c) a lipid
    d) **the energy currency of the cell**

47. ATP contains:
    a) one phosphate group
    b) two phosphate groups
    c) **three phosphate groups**
    d) four phosphate groups

48. Hydrolysis of ATP releases:
    a) DNA
    b) RNA
    c) protein
    d) **energy**

49. Vitamins are mainly:
    a) energy sources
    b) structural materials
    c) hormones
    d) **organic cofactors**

50. Enzyme specificity depends mainly on the:
    a) temperature
    b) pH
    c) water content
    d) **shape of the active site**

51. The lock-and-key model explains:
    a) DNA replication b) **enzyme action**
    c) membrane structure d) protein synthesis

52. Denaturation of an enzyme usually results in:
    a) faster reaction b) no change
    c) more products d) **loss of activity**

53. The optimal pH for most human enzymes is close to:
    a) 2 b) 5
    c) **7** d) 10

54. Competitive inhibitors:
    a) destroy the enzyme
    b) bind the enzyme permanently
    c) bind away from the active site of the enzyme
    d) **compete with the substrate for the active site of the enzyme**

55. The end product of protein digestion is:
    a) fatty acids b) glucose
    c) nucleotides d) **amino acids**

56. The end product of starch digestion is mainly:
    a) fructose b) sucrose
    c) **glucose** d) lactose

57. The end product of fat digestion is:
    a) amino acids b) glucose
    c) **fatty acids and glycerol** d) nucleotides

58. A disaccharide is made of:
    a) one monosaccharide b) **two monosaccharides**
    c) two glucose molecules d) two fructose molecules

59. Which of the following is the main source of energy in animal cells?
    a) starch b) cellulose
    c) **glucose** d) chitin

60. Which molecule is the universal carrier of genetic information?
    a) protein b) RNA
    c) ATP d) **DNA**

Section C – Microbiology & virology

1. Bacteria are:
   a) eukaryotic
   b) viruses
   c) organelles
   d) **prokaryotic**

2. Bacteria contain:
   a) nucleus
   b) mitochondria
   c) Golgi apparatus
   d) **ribosomes**

3. The bacterial chromosome is usually:
   a) linear
   b) in the nucleus
   c) in the plasmid
   d) **circular**

4. Bacteriophages are:
   a) bacteria
   b) fungi
   c) prions
   d) **viruses that infect bacteria**

5. The extracellular, infectious form of a virus is called:
   a) prion
   b) viroid
   c) **virion**
   d) capsid

6. The protein coat of a virus is called:
   a) viral DNA
   b) cell wall
   c) envelope
   d) **capsid**

7. Viruses are:
   a) cells
   b) fungi
   c) bacteria
   d) **obligate intracellular parasites**

8. Viroids are:
   a) bacteria
   b) proteins
   c) fungi
   d) **small RNA molecules**

9. Prions are:
   a) bacteria
   b) viruses
   c) **infectious proteins**
   d) DNA molecules

10. HIV is a:
    a) bacterium
    b) **virus**
    c) fungus
    d) protozoa

11. HIV primarily attacks:
    a) neurons
    b) erythrocytes
    c) hepatocytes
    d) **lymphocytes**

12. Vaccines contain:
    a) lymphocytes
    b) hormones
    c) **antigens**
    d) antibodies

13. Antibodies are:
    a) lipids
    b) carbohydrates
    c) DNA
    d) **proteins**

14. Antigens are:
    a) enzymes
    b) cells or foreign substances
    c) hormones
    d) **foreign substances that trigger an immune response**

15. White blood cells belong to:
    a) cardio-vascular system
    b) digestive system
    c) endocrine system
    d) **immune system**

16. Cholesterol is:
    a) an enzyme
    b) an antibiotic
    c) **precursor of steroid hormones**
    d) an antiviral protein

17. The bacterial cell wall is made of:
    a) cellulose
    b) chitin
    c) glycogen
    d) **peptidoglycan**

18. Flagella in bacteria are used for:
    a) feeding
    b) division
    c) respiration
    d) **movement**

19. Endospores help bacteria to:
    a) move
    b) reproduce
    c) **survive harsh conditions**
    d) digest nutrients

20. Cyanobacteria are:
    a) eukaryotes
    b) fungi
    c) viruses
    d) **prokaryotic photosynthetic organisms**

21. Antibiotics act primarily on:
    a) host cells
    b) fungi
    c) viruses
    d) **bacteria**

22. Antibiotics are mainly effective against which type of organisms?
    a) **bacteria**
    b) viruses
    c) fungi
    d) eukaryotes

23. Bacteriophages usually have:
    a) only RNA
    b) only envelope
    c) **head and tail structure**
    d) only DNA

24. Salmonellosis is caused by:
    a) **bacteria**
    b) fungi
    c) virus
    d) parasite

25. Ebola virus is a:
    a) **RNA virus**
    b) DNA virus
    c) protein virus
    d) retrovirus

26. Bacteria reproduce mainly by:
    a) mitosis
    b) meiosis
    c) **binary fission**
    d) budding

27. Bacterial spores are primarily formed for:
    a) reproduction
    b) **survival under harsh conditions**
    c) protein synthesis
    d) energy production

28. Cyanobacteria differ from most bacteria because they:
    a) lack a cell wall
    b) **perform photosynthesis**
    c) are prokaryotic
    d) reproduce by binary fission

29. Bacterial capsules mainly help in:
    a) respiration
    b) protein synthesis
    c) **protection from the immune system**
    d) movement

30. Binary fission produces:
    a) four different daughter cells
    b) four identical cells
    c) two different cells
    d) **two identical daughter cells**

31. Antibiotics are ineffective against:
    a) bacteria b) fungi
    c) **viruses** d) some protozoa

32. Some bacteria can survive extreme heat by forming:
    a) flagella b) capsule
    c) **endospores** d) pili

33. Plasmids are important because they can:
    a) store RNA
    b) store protein
    c) **carry genes for antibiotic resistance**
    d) store glycoproteins

34. Pili in bacteria are used for:
    a) movement b) digestion
    c) **attachment** d) respiration

35. The bacterial cell wall provides:
    a) energy b) digestion
    c) protein synthesis d) **shape and protection**

36. Facultative anaerobes can survive:
    a) only with oxygen b) only without oxygen
    c) **with or without oxygen** d) only in water

37. Obligate aerobes require:
    a) no oxygen b) **oxygen to survive**
    c) high CO_2 d) low pH

38. Obligate anaerobes:
    a) need oxygen b) **survive only without oxygen**
    c) require glucose only d) produce spores only

39. Bacteria reproduce faster under:
    a) low nutrients b) cold conditions
    c) darkness d) **optimal temperature and nutrients**

40. Bacterial transformation is:
    a) virus infection b) **uptake of foreign DNA**
    c) binary fission d) a spore formation

Section D – Cell division & genetics

1. Mitosis occurs in:
   a) gametes
   b) bacteria
   c) **somatic cells**
   d) germ cells

2. Meiosis occurs in:
   a) liver cells
   b) nerve cells
   c) **germ cells**
   d) somatic cells

3. Mitosis produces:
   a) 4 different cells
   b) 2 different cells
   c) 4 identical cells
   d) **2 identical cells**

4. Meiosis produces:
   a) 2 diploid cells
   b) 2 haploid cells
   c) 4 diploid cells
   d) **4 haploid cells**

5. Crossing-over occurs during:
   a) prophase II
   b) metaphase II
   c) anaphase II
   d) **prophase I**

6. The pairing of homologous chromosomes during meiosis is called:
   a) DNA replication
   b) spindle formation
   c) chromosome separation
   d) **crossing-over**

7. Chiasmata are:
   a) centromeres
   b) spindle fibers
   c) **sites of crossing-over**
   d) telomeres

8. Metaphase is characterized by:
   a) DNA replication
   b) chromatid separation
   c) decondensation
   d) **alignment of chromosomes at the cell equator**

9. During anaphase:
   a) chromosomes align at the cell equator
   b) DNA replicates
   c) nuclear membrane reforms
   d) **sister chromatids separate**

10. Telophase involves:
    a) spindle formation
    b) condensation
    c) **reformation of the nuclear membrane**
    d) separation of chromatids

11. Interphase includes:
    a) G1, G2, and G3 phases
    b) only G1
    c) only G2
    d) **G1, S, and G2 phases**

12. DNA replication occurs in:
    a) G1 phase
    b) M phase
    c) G2 phase
    d) **S phase**

13. The most important event of interphase is:
    a) transcription
    b) translation
    c) **DNA replication**
    d) respiration

14. The centromere:
    a) synthesizes DNA
    b) attaches ribosomes
    c) forms a spindle
    d) **joins sister chromatids**

15. Sister chromatids are:
    a) homologous chromosomes
    b) random DNA
    c) different chromosomes
    d) **identical copies of a chromosome**

16. Human somatic cells have:
    a) 23 chromosomes
    b) 44 chromosomes
    c) 92 chromosomes
    d) **46 chromosomes**

17. Gametes have:
    a) 46 chromosomes
    b) 92 chromosomes
    c) 44 chromosomes
    d) **23 chromosomes**

18. Haploid means:
    a) 2n
    b) 3n
    c) 4n
    d) **n**

19. Diploid means:
    a) n
    b) 3n
    c) 4n
    d) **2n**

20. The zygote is:
    a) haploid
    b) polyploid
    c) triploid
    d) **diploid**

21. Fertilization restores:
    a) haploidy
    b) triploidy
    c) tetraploidy
    d) **diploidy**

22. A karyotype is a:
    a) gene map
    b) DNA sequence
    c) protein structure
    d) **set of chromosomes**

23. Autosomes are:
    a) sex chromosomes
    b) extra chromosomes
    c) mutant chromosomes
    d) **non-sex chromosomes**

24. Sex chromosomes in humans are:
    a) XX only
    b) YY
    c) **XX or XY**
    d) XY only

25. Down syndrome is caused by:
    a) duplication
    b) deletion
    c) polyploidy
    d) **trisomy 21**

26. Duplication is:
    a) polyploidy
    b) aneuploidy
    c) **intrachromosomal aberration**
    d) interchromosomal aberration

27. Deletion refers to:
    a) extra segment of chromosome
    b) inversion
    c) **loss of a chromosome segment**
    d) exchange

28. Inversion is:
    a) loss of segment
    b) gain of segment
    c) duplication
    d) **reversal of a chromosome segment**

29. Translocation is:
    a) copying part of a chromosome
    b) duplication of a chromosomal segment
    c) **movement of a chromosome segment to a different chromosome**
    d) delition of a chromosomal segment

30. Aneuploidy refers to:
    a) change in protein
    b) change in RNA
    c) change in gene
    d) **change in chromosome number**

31. Homologous chromosomes are:
    a) two identical copies of a chromosome made during cell division
    b) chromosomes chosen at random from the cell
    c) two chromosomes inherited from the same parent
    d) **a pair of chromosomes, one from the mother and one from the father, that have the same genes in the same order**

32. The process by which gametes are formed is called:
    a) mitosis
    b) fertilization
    c) **meiosis**
    d) binary fission

33. Independent assortment occurs during:
    a) prophase II
    b) telophase II
    c) **metaphase I**
    d) prophase I

34. A cell with 2n = 46 will produce gametes with:
    a) 46 chromosomes
    b) 92 chromosomes
    c) 44 chromosomes
    d) **23 chromosomes**

35. Non-disjunction can result in:
    a) mutation of protein
    b) change in gene sequence
    c) **trisomy or monosomy**
    d) normal meiosis

36. Crossing-over increases:
    a) mutation rate
    b) number of chromosomes
    c) **genetic variation**
    d) cell division speed

37. Meiosis I is also called:
    a) equational division
    b) mitosis
    c) **reductional division**
    d) binary fission

38. Meiosis II is similar to:
    a) meiosis I b) **mitosis**
    c) fertilization d) cytokinesis

39. During meiosis, synapsis occurs in:
    a) metaphase II b) **prophase I**
    c) anaphase I d) telophase II

40. The process that halves the chromosome number is:
    a) mitosis b) binary fission
    c) **meiosis** d) duplication

41. Fertilization combines:
    a) two somatic cells b) gametes and zygote
    c) **two haploid gametes** d) somatic and sex cells

42. Telomeres are located at:
    a) centromeres b) spindle fibers
    c) **ends of chromosomes** d) cytoplasm

43. The function of telomeres is to:
    a) join chromatids b) **protect chromosome ends**
    c) form spindle d) replicate DNA

44. G1 phase of interphase is mainly for:
    a) DNA replication b) **cell growth**
    c) chromosome segregation d) mitosis

45. S phase of interphase involves:
    a) protein synthesis b) cell growth
    c) **DNA replication** d) cytokinesis

46. G2 phase is for:
    a) chromosome alignment b) DNA replication
    c) **preparing for mitosis** d) cytokinesis

47. The spindle fibers attach to:
    a) telomeres b) **centromeres**
    c) cytoplasm d) nucleolus

48. Chromatin condenses into visible chromosomes during:
    a) interphase b) **prophase**
    c) anaphase d) telophase

49. Cytokinesis is the process of:
    a) chromosome replication b) DNA synthesis
    c) **division of cytoplasm** d) spindle formation

50. The main difference between mitosis and meiosis is:
    a) mitosis produces haploid cells
    b) meiosis produces identical cells
    c) meiosis occurs in somatic cells
    d) **meiosis produces genetically different cells**

Section E – Human anatomy & physiology

1. Blood is a type of:
   a) epithelial tissue b) muscle tissue
   c) nervous tissue d) **connective tissue**

2. The heart is located in the:
   a) abdominal cavity b) pelvic cavity
   c) cranial cavity d) **thoracic cavity**

3. The outermost covering of the heart is the:
   a) endocardium b) myocardium
   c) **pericardium** d) epicardium

4. The contraction of the heart is called:
   a) diastole b) pulse
   c) pause d) **systole**

5. The relaxation of the heart is called:
   a) **diastole** b) systole
   c) pulse d) pause

6. The highest blood pressure is in the:
   a) pulmonary artery b) vena cava
   c) right atrium d) **aorta**

7. Blood moves in one direction in the circulatory system because of:
   a) arteries b) nerves
   c) muscles d) **valves**

8. The vein that carries blood to the liver is the:
   a) inferior vena cava b) liver vein
   c) **portal vein** d) superior vena cava

9. The systemic circulation starts from the:
   a) right atrium b) left atrium
   c) **left ventricle** d) right ventricle

10. The pulmonary circulation starts from the:
    a) left ventricle b) **right ventricle**
    c) left atrium d) right atrium

11. Red blood cells are called:
    a) leukocytes
    b) thrombocytes
    c) **erythrocytes**
    d) phagocytes

12. The main function of erythrocytes is:
    a) immunity
    b) clotting
    c) digestion
    d) **oxygen transport**

13. Which blood cells lack a nucleus?
    a) leukocytes
    b) lymphocytes
    c) **erythrocytes**
    d) thrombocytes

14. Blood clotting is performed by:
    a) erythrocytes
    b) lymphocytes
    c) plasma
    d) **platelets**

15. Hemoglobin is found in:
    a) plasma
    b) leukocytes
    c) **erythrocytes**
    d) platelets

16. Blood group AB has:
    a) anti-A and -B antibodies
    b) only A antigen
    c) only B antigen
    d) **A and B antigens**

17. Blood group O has:
    a) A antigens
    b) B antigens
    c) A and B antigens
    d) **no antigens**

18. Blood group A has:
    a) antigen B
    b) **antigen A**
    c) anti-A antibodies
    d) antigen A and B

19. Blood group B has:
    a) antigen A
    b) **antigen B**
    c) anti-B antibodies
    d) antigen A and B

20. Antibodies are found in:
    a) erythrocytes
    b) platelets
    c) neurons
    d) **plasma**

21. The main artery of the body is the:
    a) pulmonary artery
    b) carotid artery
    c) **aorta**
    d) vena cava

22. The liquid part of blood is called:
    a) cerebrospinal fluid b) lymph
    c) water d) **plasma**

23. Lymphocytes are mainly involved in:
    a) oxygen transport b) clotting
    c) **immunity** d) digestion

24. Veins differ from arteries because veins:
    a) have thicker walls b) carry only oxygenated blood
    c) have higher pressure d) **have valves**

25. The main function of platelets is:
    a) oxygen transport b) immunity
    c) nutrition d) **clotting**

26. Which vessel carries oxygenated blood to the heart?
    a) pulmonary artery b) vena cava
    c) hepatic vein d) **pulmonary vein**

27. The atria of the heart:
    a) pump blood out of the body b) pump blood to lungs only
    c) **receive blood into the heart** d) form valves

28. The ventricles of the heart:
    a) receive blood from veins b) form valves
    c) **pump blood out of the heart** d) control heartbeat

29. Which chamber of the heart receives blood from the body?
    a) left ventricle b) **right atrium**
    c) left atrium d) right ventricle

30. The vessel that carries oxygen-rich blood to the body is:
    a) pulmonary artery b) pulmonary vein
    c) **aorta** d) superior vena cava

31. The pericardial fluid functions to:
    a) contract the heart b) pump blood
    c) transmit signals d) **reduce friction around the heart**

32. The coronary arteries supply with blood the:
    a) lungs b) brain
    c) kidneys d) **heart muscle**

33. The main component of plasma is:
    a) glucose b) proteins
    c) platelets d) **water**

34. Plasma proteins include:
    a) hemoglobin only b) DNA only
    c) platelets only d) **fibrinogen**

35. The oxygen-carrying pigment in red blood cells is:
    a) myoglobin b) chlorophyl
    c) fibrin d) **hemoglobin**

36. The lifespan of an erythrocyte is approximately:
    a) 30 days b) 60 days
    c) 180 days d) **120 days**

37. White blood cells are mainly responsible for:
    a) oxygen transport b) clotting
    c) **defense against infection** d) nutrient transport

38. The average lifespan of platelets in the blood is:
    a) **8–11 days** b) 1–2 days
    c) 15–20 days d) 30–40 days

39. The heart valves ensure:
    a) blood flows backwards b) diffusion of oxygen
    c) **blood flows in one direction** d) clotting

40. The pulmonary artery carries:
    a) oxygenated blood b) **deoxygenated blood**
    c) lymph d) plasma

41. The pulmonary vein carries:
    a) deoxygenated blood b) plasma
    c) lymph d) **oxygenated blood**

42. The aorta carries:
    a) deoxygenated blood b) lymph
    c) plasma d) **oxygenated blood to the body**

43. Capillaries are:
    a) large arteries b) veins
    c) **tiny vessels for exchange** d) lymph vessels

44. The portal vein carries blood from:
    a) lungs to heart b) heart to lungs
    c) heart to liver d) **intestines to liver**

45. The lymphatic system drains:
    a) oxygen b) blood
    c) nutrients d) **tissue fluid**

46. Red bone marrow is the site of:
    a) oxygen transport b) fat storage
    c) **blood cell formation** d) enzyme production

47. Hemostasis is:
    a) oxygen transport b) immunity
    c) **blood clotting** d) digestion

48. The term “systolic pressure” refers to:
    a) pressure during heart relaxation
    b) **pressure during heart contraction**
    c) pressure in veins
    d) pressure in capillaries

49. The term “diastolic pressure” refers to:
    a) pressure during heart contraction
    b) **pressure during heart relaxation**
    c) pulse
    d) capillary pressure

50. The oxygen-carrying capacity of blood depends mainly on:
    a) plasma volume b) **hemoglobin concentration**
    c) platelets d) lymphocytes

Section F – Respiratory & excretory system

1. Gas exchange occurs in the:
   a) trachea
   b) bronchi
   c) nasal cavity
   d) **alveoli**

2. The trachea is supported by:
   a) bone rings
   b) cartilage rings
   c) bone semirings
   d) **cartilage semirings**

3. The larynx is responsible for:
   a) breathing only
   b) gas exchange
   c) smell
   d) **voice production**

4. Vocal cords are located in the:
   a) pharynx
   b) trachea
   c) bronchi
   d) **larynx**

5. The diaphragm is a:
   a) bone
   b) gland
   c) cartilage
   d) **muscle**

6. Inhalation occurs when the diaphragm:
   a) stops
   b) breaks
   c) **contracts**
   d) relaxes

7. Exhalation occurs when the diaphragm:
   a) contracts
   b) breaks
   c) stops
   d) **relaxes**

8. Oxygen is transported in blood mainly by:
   a) leukocytes
   b) plasma
   c) platelets
   d) **hemoglobin**

9. The main excretory organ is the:
   a) lungs
   b) liver
   c) skin
   d) **kidney**

10. The structural and functional unit of the kidney is the:
    a) ureter
    b) pelvis
    c) urinary bladder
    d) **nephron**

11. Urine formation occurs in the:
    a) urinary bladder b) urethra
    c) ureter d) **nephron**

12. Filtration occurs in the:
    a) tubules b) loop of Henle
    c) pelvis d) **glomerulus**

13. The Malpighian body consists of:
    a) glomerulus and Bowman's vessel
    b) only capsule
    c) tubule and pelvis
    d) **glomerulus and Bowman's capsule**

14. The ureter connects:
    a) bladder and outside b) two kidneys
    c) kidney and urethra d) **kidney and bladder**

15. The urethra:
    a) filters blood b) produces urine
    c) brings urine to bladder d) **removes urine from bladder**

16. The final urine normally does not contain:
    a) water b) salts
    c) urea d) **glucose and amino acids**

17. Reabsorption occurs mainly in the:
    a) glomerulus b) pelvis
    c) ureter d) **tubules**

18. Sweating is a function of:
    a) kidney b) lungs
    c) liver d) **skin**

19. The urine bladder is a:
    a) filtration organ b) excretion organ
    c) digestive organ d) **storage organ**

20. Which part of the nephron filters blood to start forming urine?
    a) urine bladder b) **glomerulus**
    c) collecting duct d) ureter

21. Which hormone from the kidneys helps make red blood cells?
    a) insulin
    b) **erythropoietin**
    c) noradrenaline
    d) adrenaline

22. The renal pelvis collects:
    a) glomerular filtrate before reabsorption
    b) **urine from nephrons**
    c) blood from renal artery
    d) lymph

23. The main nitrogenous waste in humans is:
    a) ammonia
    b) uric acid
    c) **urea**
    d) creatinine

24. The alveoli are surrounded by:
    a) cartilage
    b) smooth muscle
    c) **capillaries**
    d) bronchioles

25. Which organ is the main site of gas exchange in the body?
    a) trachea
    b) **lungs**
    c) bronchi
    d) nose

26. The trachea divides into:
    a) alveoli
    b) larynx
    c) bronchioles
    d) **bronchi**

27. Gas exchange occurs by:
    a) active transport
    b) filtration
    c) absorption
    d) **diffusion through alveolar walls**

28. The excretion of water and salts is mainly regulated by:
    a) lungs
    b) **kidneys**
    c) liver
    d) skin

29. Urea is formed in the:
    a) kidneys
    b) lungs
    c) **liver**
    d) heart

30. What is the main function of the ureter?
    a) store urine
    b) **carry urine from kidney to bladder**
    c) filter blood
    d) produce urine

31. The nephron consists of:
    a) glomerulus only
    b) tubule only
    c) pelvis only
    d) **glomerulus and renal tubule**

32. Where does oxygen move from the lungs into the blood?
    a) bronchi
    b) **alveoli**
    c) trachea
    d) diaphragm

33. Which tube carries air from the throat to the lungs?
    a) esophagus
    b) **trachea**
    c) ureter
    d) bronchiole

34. The respiratory membrane is made of:
    a) alveolar wall only
    b) capillary wall only
    c) **alveolar wall and capillary wall**
    d) bronchioles

35. The kidneys receive blood from the:
    a) renal vein
    b) ureter
    c) **renal artery**
    d) aorta only

36. The urinary bladder:
    a) **stores urine**
    b) is made of striated muscle
    c) connects the kidney with the urethra
    d) has an opening for the prostate gland

37. Urination is controlled by:
    a) reflexes in the spinal cord
    b) **both voluntary and involuntary control**
    c) the pumping of the heart
    d) the movement of the lungs

38. The function of the respiratory system is to:
    a) digest food
    b) remove nitrogenous wastes
    c) **exchange O_2 and CO_2**
    d) pump blood

39. Carbon dioxide is transported in blood:
    a) dissolved in plasma only
    b) bound to hemoglobin only
    c) as bicarbonate
    d) **all of the above**

40. The main muscle of respiration is the:
    a) intercostal muscles
    b) heart
    c) **diaphragm**
    d) trachea

Section G – Nervous & endocrine system

1. Nervous tissue forms:
   a) brain and muscles
   b) spinal cord and muscles
   c) skin and brain
   d) **brain and spinal cord**

2. The central nervous system consists of:
   a) nerves only
   b) brain only
   c) spinal cord only
   d) **brain and spinal cord**

3. The spinal cord is made of:
   a) gray and black matter
   b) white and black matter
   c) only white matter
   d) **gray and white matter**

4. The cerebellum controls:
   a) thinking and balance
   b) breathing and coordination
   c) **coordination and balance**
   d) speech and thinking

5. The medulla oblongata controls:
   a) breathing and vision
   b) memory and breathing
   c) **breathing and heartbeat**
   d) hormone production

6. The midbrain is involved in:
   a) taste
   b) smell
   c) **vision and hearing**
   d) breathing

7. The substantia nigra is located in the:
   a) cerebellum
   b) diencephalon
   c) **mesencephalon**
   d) pons

8. A neuron consists of:
   a) cell body, dendrite, and axon
   b) dendrites and axon
   c) cell body, dendrite, and axons
   d) **cell body, dendrites, and axon**

9. The myelin sheath is formed by:
   a) neurons
   b) blood cells
   c) endothelial cells
   d) **glial cells**

10. Reflex actions are:
    a) voluntary
    b) learned
    c) conscious
    d) **involuntary**

11. The pituitary gland is:
    a) digestive gland
    b) exocrine gland
    c) reproductive gland
    d) **master endocrine gland**

12. Growth hormone is secreted by:
    a) thyroid gland
    b) adrenal gland
    c) **pituitary gland**
    d) pancreas

13. Thyroxin is secreted by:
    a) pituitary gland
    b) **thyroid gland**
    c) adrenal gland
    d) pancreas

14. Insulin is secreted by:
    a) liver
    b) **pancreas**
    c) pituitary gland
    d) thyroid gland

15. Insulin decreases:
    a) protein
    b) blood pressure
    c) oxygen
    d) **blood glucose**

Section H – Sense organs

1. The retina contains:
   a) hormones
   b) sclera
   c) **photoreceptors**
   d) muscles

2. Rods are responsible for:
   a) color vision
   b) sharp vision
   c) peripheral vision only
   d) **black and white vision**

3. Cones are responsible for:
   a) night vision
   b) black and white vision
   c) side vision
   d) **color vision**

4. The iris controls:
   a) lens shape
   b) cornea shape
   c) retina thickness
   d) **pupil diameter**

5. The lens is:
   a) flat
   b) concave
   c) rigid
   d) **biconvex**

6. The blind spot lacks:
   a) rods
   b) cones
   c) blood vessels
   d) **photoreceptors**

7. The organ of hearing is:
   a) eustachian tube
   b) semicircular canals
   c) **organ of Corti**
   d) stirrup

8. The ear ossicles are located in the:
   a) outer ear
   b) inner ear
   c) auditory nerve
   d) **middle ear**

9. The cochlea is part of:
   a) outer ear
   b) middle ear
   c) **inner ear**
   d) eustachian tube

10. Which part of the ear converts sound waves into nerve signals?
    a) **cochlea**
    b) semicircular canals
    c) eustachian tube
    d) tympanic membrane

II. Mark the correct statements

*(Note: the right answers are given in **Bold**)*

1. **The tympanic cavity is connected to the pharynx via the Eustachian tube.**
2. The viral capsid is made of DNA.
3. Iris produces tears.
4. **Rhodopsin is a pigment in the retinal rods.**
5. **The viral capsid is a protein structure.**
6. Retina has taste receptors.
7. Hemoglobin contains Mg^{2+} atoms to connect oxygen.
8. **Leukocytes participate in immune defense.**
9. **Platelets are essential for blood clotting.**
10. Amino acids bind directly to DNA during translation.
11. The mitotic spindle is made of collagen fibers.
12. **Centrioles participate in spindle formation.**
13. The nucleoid in bacteria is membrane-bound.
14. Chloroplasts perform respiration in plants.
15. **The pituitary gland secretes somatotropin (growth hormone).**
16. Peroxisomes are non-membranous organelles.
17. The pituitary gland secretes insulin.
18. **The right ventricle pumps blood to the lungs.**
19. Light-dependent reactions occur in the nucleus.
20. **The light-dependent reactions occur in thylakoids.**
21. **Chloroplasts have their own DNA.**
22. RNA is made of deoxyribonucleotides.
23. **The nucleoid is the DNA-containing region in prokaryotes.**
24. ATP is a structural protein where the energy is stored.

25. **Enzymes are biological catalysts.**
26. **The small intestine is the main site of nutrients absorption.**
27. The stomach is main absorption site.
28. **Bile emulsifies fats.**
29. **Pepsin works in the stomach.**
30. Trypsin is produced by the liver.
31. The liver stores calcium.
32. Vitamin D helps the transport of oxygen.
33. **The pupil is located in the center of the iris.**
34. Hypothalamus regulates vision.
35. **The kidney regulates water and salt balance.**
36. The glomerulus is located inside the ureter.
37. **The loop of Henle is part of the nephron.**
38. **The heart has four chambers.**
39. The right ventricle pumps blood to the body.
40. **The left ventricle has the thickest wall.**
41. Arteries have pocket valves.
42. **Veins usually have pocket valves.**
43. Diaphragm is main expiration muscle.
44. **The diaphragm is the main muscle of inspiration.**
45. Medulla controls vision.
46. **The medulla oblongata controls breathing and heart rate.**
47. Spinal cord produces hormones.
48. Thalamus receives information from all sensory systems except taste.
49. **The cerebrum is responsible for conscious activities.**
50. The pupil is part of the sclera.
51. **Excess body fat is stored mainly in the deepest layer of the skin.**

52. Fat is stored mainly in the epidermis.
53. Synapses connect muscles to bones.
54. **Myelin increases conduction speed.**
55. **Endocrine glands secrete hormones into the blood.**
56. Endocrine glands use ducts for their secretions.
57. Thyroid gland produces melatonin.
58. **Parathyroid hormone regulates calcium balance.**
59. **The thymus is important for immune development.**
60. There are two spongy bodies in the penis.
61. **Vaccination induces active immunity.**
62. Antibodies are made by erythrocytes.
63. **Phagocytosis is engulfing of particles by a cell.**
64. **Osmosis is movement of water through a semipermeable membrane.**
65. **The Golgi apparatus modifies and packages proteins.**
66. The trachea is supported by bone rings.
67. Diffusion requires ATP.
68. **The trachea is supported by cartilage semi-rings.**
69. Active transport never needs energy.
70. **Mitochondria are the main site of cellular respiration.**
71. Matrix is inside the plastids.
72. **Cristae increase mitochondrial inner area.**
73. Rough endoplasmic reticulum makes lipids.
74. **Smooth endoplasmic reticulum participates in lipid synthesis and detoxification.**
75. Golgi complex synthesizes DNA.
76. **Vacuoles are important for storage in plant cells.**
77. Plant cell wall is made of chitin.

78. **The thyroid gland produces thyroxine.**
79. **mRNA, rRNA, and tRNA all participate in translation.**
80. tRNA does not participate in translation.
81. **Chitin is found in fungal cell walls.**
82. The ureter filters waste from the blood.
83. **Amino acids are matched to mRNA codons via tRNA.**
84. The bones of the trunk are mostly long.
85. **Trypsin is produced by the pancreas.**
86. Cristae reduce inner surface area of mitochondria.
87. **Progesterone plays a key role in maintaining pregnancy.**
88. Progesterone regulates blood clotting.
89. **Mineralocorticoids regulate salt and water balance.**
90. **Peroxisomes are membrane-bound vesicles containing many enzymes.**
91. **Diffusion is movement down a concentration gradient.**
92. **Melanin is produced by melanocytes.**
93. **The matrix is the inner space of mitochondria.**
94. The cavities in the frontal bone and the upper jaw are called synapses.
95. **The lungs are covered by pleura.**
96. **The plant cell wall is mainly made of cellulose.**
97. Lipids dissolve best in water.
98. **The pancreas has both exocrine and endocrine functions.**
99. Adrenaline is produced by the suprarenal cortex.
100. **The iris contains pigment and regulates pupil size.**
101. The pancreas produces insulin and glycogen.
102. **Mitochondria contain their own DNA.**
103. **Hemoglobin transports oxygen.**

104. Leukocytes transport oxygen.

105. **Fibrinogen is essential for blood clotting.**

106. The prostate is a muscle.

107. **Crossing-over occurs in meiosis during prophase I.**

108. **The mitotic spindle is made of microtubules.**

109. Mitochondria contain linear DNA.

110. The first cervical vertebra is called axis.

111. **ATP is the main energy currency of the cell.**

112. Skeletal muscles are attached to the bones by ligaments.

113. **A gene is a segment of DNA that codes for an RNA or a protein.**

114. Starch is a lipid molecule.

115. **During prophase, chromatin condenses into visible chromosomes.**

116. In prophase chromosomes disappear.

117. **Polynucleotide chains begin with a free phosphate group.**

118. There are peptide bonds between aminoacids in the polynucleotide chains.

119. **Adrenaline is produced by the suprarenal glands.**

120. **Skeletal muscles have a body and tendons.**

121. Fibrinogen prevents blood clotting.

122. **Lipids dissolve well in organic solvents.**

123. **Smooth muscle cells are spindle-shaped.**

124. Chromatin condensation starts in telophase.

125. **The nephron performs filtration, reabsorption, and secretion.**

126. Smooth muscle cells are branched like neurons.

127. The nephron transmits signals.

128. **Proteins are synthesized on ribosomes.**

129. Chromosomes disappear during anaphase.

130. **Chromatin condensation starts in prophase.**

131. Cilia are membarane-bound organelles.

132. **The nucleus is the site of mRNA synthesis.**

133. **Translation occurs in the cytoplasm.**

134. Centrioles synthesize proteins for mitotic spindle.

135. **Prokaryotic cells lack a membrane-bound nucleus.**

136. Proteins are synthesized in lysosomes.

137. Malpighian bodies are located in the kidney medulla.

138. **The retina contains photoreceptors.**

139. **The Malpighian bodies are found in the kidney.**

140. **Chromosomes consist of DNA and proteins.**

141. The heart has three chambers.

142. **Cilia and flagella are built from microtubules.**

143. Mitochondria in plants perform photosynthesis.

144. Smooth endoplasmic reticulum is covered with ribosomes.

145. **Teeth are hard structures embedded in the jaws.**

146. The nucleolus synthesizes rRNA and lipids.

147. **A polysome is one mRNA molecule with many ribosomes attached.**

148. Transcription occurs in the cytoplasm of eukaryotes.

149. Calcitonin is produced by the parathyroid glands.

150. **Insulin is produced by the pancreas.**

151. Arteries carry blood to the heart.

152. Prokaryotes have a nucleus.

153. Ribosomes contain rRNA, tRNA and ribosomal proteins.

154. **The pleura covers the outer surface of the lungs.**

155. Systemic circulation starts from the pulmonary artery.

156. **The corpus callosum connects the two cerebral hemispheres.**

157. Parathyroid hormone regulates glucose level in the blood.

158. The nucleus has no membrane.

159. **The nucleus is separated from the cytoplasm by a double membrane.**

160. **Ribs are flat bones.**

161. Gas exchange occurs in thin-walled sacks called bronchioles.

162. **Ribosomes contain rRNA and proteins.**

163. **The hypofunction of the thyroid gland can cause myxedema.**

164. The ureters are single sacs.

165. Platelets perform gas exchange in the tissues and cells.

166. Pancreatic hypofunction causes scurvy.

167. **The hypofunction of the pancreas can cause diabetes mellitus.**

168. Thyroid hypofunction causes acromegaly.

169. **The ureters are paired tubular organs.**

170. Phagocytosis is hormone secretion.

171. Fertilization causes ovulation.

172. **If fertilization occurs, a zygote is formed.**

173. The biceps extends the elbow.

174. **A codon is a triplet of nucleotides on mRNA.**

175. Codons are located on tRNA.

176. Ribs are long bones.

177. Transcription makes proteins.

178. The pituitary gland is in the thorax.

179. **The pituitary gland is located at the base of the brain.**

180. The vestibular system controls temperature.

181. Bones are the active part of movement.

182. **Muscles are the active part of the locomotor system.**

183. **Systemic circulation starts from the left ventricle.**

184. **The cerebellum coordinates movement and balance.**

185. The acrosome stores glycogen for the sperm.

186. **Conditioned reflexes are acquired.**

187. **The vestibular system is responsible for balance.**

188. Conditioned reflexes are inherited.

189. **The bacterial cell wall is mainly made of polysaccharides.**

190. **The sclera is the white outer layer of the eyeball.**

191. **Human erythrocytes lack a nucleus.**

192. Carbohydrates are not used for energy.

193. Bacterial walls are made of cellulose.

194. **Denaturation shows that higher protein structure depends on the primary structure.**

195. The sclera is the pigmented eye layer.

196. **Transcription is the synthesis of RNA from DNA.**

197. Replication duplicates proteins.

198. **Replication is the duplication of DNA.**

199. Vacuoles exist only in animal cells.

200. Gametes are diploid cells.

201. **Meiosis produces haploid cells.**

202. Human erythrocytes have a nucleus.

203. **Carbohydrates are a major source of energy for cells.**

204. Polypeptides are made of nucleotides.

205. **Gas exchange occurs in the alveoli.**

206. Accommodation is the process by which the eye adjusts to different levels of light.

207. **The zygote is diploid.**

208. White matter is made of neuron cell bodies.

209. Keratin is found in human bones.

210. **Chromatids are connected by a centromere.**

211. **Keratin is found in the epidermis, hair, and nails.**

212. Mitosis produces gametes.

213. **Bones can be long, short, and flat.**

214. **Pepsin is found in the stomach.**

215. The cochlea is the main organ of vision.

216. Blood pressure is lowest in capillaries.

217. The left ventricle has the thinnest heart wall.

218. **Lysosomes are membrane-bound organelles which contain digestive enzymes.**

219. **Synapses are junctions between neurons.**

220. A polysome is many ribosomes attached on a DNA molecule.

221. **Active transport requires energy.**

222. Denaturation changes the amino acid sequence.

223. **Mitosis is the basis of growth and asexual reproduction.**

224. All bones are long.

225. **Urine is formed in the nephrons.**

226. The pleura covers all respiratory organs.

227. **Telophase follows anaphase in mitosis.**

228. Adrenal glands are exocrine.

229. **RNA is composed of ribonucleotides.**

230. Plastids never contain genetic material.

231. Pepsin works in the duodenum.

232. HIV is a bacterium.

233. **The prostate is a gland.**

234. Epidermis is never renewed.

235. Myelin slows conduction.

236. **Arteries carry blood away from the heart.**

237. **Rough endoplasmic reticulum participates in protein synthesis.**

238. **The cornea covers the iris.**

239. Urine is stored in the ureters.

240. **Polypeptides are made of amino acids.**

241. Trunk muscles are divided in two groups: back and abdominal.

242. **The bones of the trunk include the vertebral column and rib cage.**

243. **The spinal cord conducts impulses and has reflex centers.**

244. **Disulfide bonds help maintain the tertiary structure of the proteins.**

245. Tertiary structure is the amino acid sequence.

246. **Meiosis includes two successive divisions.**

247. Osmosis moves proteins from higher to lower concentration.

248. The result of meiosis is the production of four genetically unique diploid gametes.

249. **The vestibular apparatus is part of the inner ear.**

250. Lungs are covered by peritoneum.

251. **The biceps brachii flexes the elbow.**

252. **The liver stores glycogen.**

253. Lysosomes are non-membranous organelles.

254. The pleura lines the trachea.

255. Crossing-over occurs in mitosis.

256. **The larynx is located above the trachea.**

257. The midbrain is part of the spinal cord.

258. **Chloroplasts are the site of photosynthesis.**

259. **Epidermal cells are renewed by cell division in deeper layers.**

260. Bile helps digestion of proteins.

261. The DNA triplet is called a genome.

262. **The triplet coding for one amino acid is called a codon.**

263. The main parts of the large intestine are ileum, colon and rectum.

264. **The pancreas has a mixed (exo- and endocrine) function.**

265. Mineralocorticoids regulate balance of organic substances.

266. The larynx is below the trachea.

267. **Chromatin is a complex of DNA and proteins.**

268. **The pleura lines the thoracic cavity and covers the lungs.**

269. Dentin is the hardest substance in the human organism.

270. **The midbrain is part of the brainstem.**

271. **HIV is an RNA virus.**

272. **Filtration, reabsorption, and secretion occur in the nephron.**

273. Upper jaw is a single bone.

274. **Plastids contain their own DNA.**

275. Lysosomes are formed in the smooth endoplasmic reticulum.

276. **Peroxisomes are membrane-bound organelles.**

277. Chromatids are connected by centrioles.

278. Rhodopsin is a pigment in the sclera.

279. **Blood pressure is the force exerted by blood against the blood vessels walls.**

280. Melanin is hormone produced by the pineal gland.

281. Enzymes contain predominantly lipids.

282. **The acrosome contains enzymes that help the sperm penetrate the oocyte.**

283. Corpus callosum connects brain to spinal cord.

284. Cerebellum controls breathing.

285. **The white matter mainly consists of nerve fibers.**

286. There are 12 pairs of spinal nerves.

287. **The larynx is involved in voice production.**

288. The stroma is the inner space of mitochondria.

289. **Arterial blood pressure is higher than venous pressure.**

290. Venous pressure is higher than arterial.

291. The cornea is behind the retina.

292. **Antibodies are produced by plasma cells.**

293. Telophase precedes metaphase.

294. **The adrenal glands are endocrine glands.**

295. Teeth crown and root are covered by enamel.

296. **The trunk muscles include chest, abdominal, and back muscles.**

297. The tympanic cavity opens into the esophagus by the Eustachian tube.

298. Vestibular apparatus is in middle ear.

299. **There are 31 pairs of spinal nerves in humans.**

300. **Vitamin D is important for calcium metabolism.**

III. Match each definition with its corresponding term

Task III.1

- Decreased secretion of insulin from the pancreas … C
- Vessels which take blood from the heart and bring it to all organs and tissues … E
- The last phase of mitosis … L
- The hormone produced by the corpus luteum … F
- Increased production of growth hormone in childhood … I
- Parasitic viruses in bacteria … J

A. prophase; B. acromegaly; C. diabetes mellitus; D. somatotropin; E. arteries; F. progesterone; G. viroids; H. veins; I. gigantism; J. phages; K. Graves' disease; L. telophase

Task III.2

- Key component of all cell membranes … G
- Storage carbohydrate in liver and muscles … C
- Structural carbohydrate in plant cell walls … I
- Basic cells of immunity … E
- Organ that produces trypsin… H
- Oxygen-transporting protein in blood … D

A. carotenoids; B. glucose; C. glycogen; D. hemoglobin; E. leukocytes; F. fats; G. phospholipids and proteins; H. pancreas; I. cellulose; J. performs photosynthesis; K. stomach; L. erythrocytes

Task III.3

- Proteins and rRNA form … L
- Molecules involved in immune response … A
- Enzyme building phosphodiester bonds during replication … H
- Products of endocrine system … D
- Protein with contractile function … E
- Consists of a lipid bilayer and proteins … F

A. antibodies; B. receptors; C. enzymes; D. hormones; E. myosin; F. cell membrane; G. denaturation; H. DNA polymerase; I. keratin; J. carbohydrates; K. RNA polymerase; L. ribosomes

Task III.4

- Contains linear DNA … C
- Synthesizes phospholipids … B
- Protein synthesis factories in the cells … F
- Produces ATP … K
- Organ where the urine is formed … E
- Organelle that modifies and packages proteins … H

A. estrogens; B. smooth endoplasmic reticulum; C. nucleus; D. prions; E. kidney; F. ribosomes; G. RNA polymerase; H. Golgi apparatus; I. urinary bladder; J. centromere; K. mitochondria; L. mitosis

Task III.5

- Enzyme in saliva … B
- Part of throat behind oral cavity … F
- Muscular ring between stomach and duodenum … H
- Enzyme in gastric juice digesting proteins … A
- Longest part of digestive tract … G
- Organ that produces bile … C

A. pepsin; B. amylase; C. liver; D. pancreas; E. rectum; F. pharynx; G. small intestine; H. pyloric sphincter; I. large intestine; J. trachea; K. trypsin; L. gallbladder

Task III.6

- Brain center for conscious activities … A
- Enzyme synthesizing new DNA strand … F
- Process of RNA synthesis … C
- Tissue connecting muscle to bone … E
- Site of protein synthesis … G
- Brain center for balance and coordination … J

A. cerebrum; B. RNA polymerase; C. transcription; D. Golgi apparatus; E. tendon; F. DNA polymerase; G. ribosome; H. cartilage; I. helicase; J. cerebellum; K. translation; L. ligase

Task III.7

- Basic cell division of germ cells … A
- Bones forming the spine … C
- End parts of chromosomes … F
- Hormone of corpus luteum … B
- Flexible connective tissue in joints … G
- Enzyme forming phosphodiester bonds in DNA … H

A. meiosis; B. progesterone; C. vertebrae; D. centromere; E. kidney; F. telomere; G. cartilage; H. DNA polymerase; I. somatotropin; J. phosphodiesterase; K. mitosis; L. flat bones

Task III.8

- Perform intracellular digestion … B
- Membrane organel involved in protein and lipid synthesis … E
- Neutralize hydrogen peroxide … A
- Carrier of genetic information … D
- Main ATP-producing organelles … F
- Forms secretory vesicles … G

A. peroxisomes; B. lysosomes; C. nuclear membrane; D. DNA; E. endoplasmic reticulum; F. mitochondria; G. Golgi apparatus; H. spindle; I. cell wall; J. chloroplast; K. proteins; L. carbohydrates

Task III.9

- Cell division producing haploid cells … C
- Brain part controlling thinking … B
- Structure holding chromatids together … F
- Enzyme synthesizing RNA … K
- Template for protein synthesis … E
- The vessel supplying the heart muscle … G

A. mitosis; B. cerebrum; C. meiosis; D. cerebellum; E. mRNA; F. centromere; G. coronary artery; H. ligase; I. centrosome; J. tRNA; K. RNA polymerase; L. DNA polymerase

Task III.10

- Structures made of rRNA and proteins … C
- Continuation of medulla oblongata … A
- Final stage of mitosis … H
- Viruses that infect prokaryotic cells … J
- Vessels carrying blood from the heart … E
- Basic units of nucleic acids … F

A. pons; B. veins; C. ribosome; D. centrosome; E. arteries; F. nucleotides; G. interphase; H. telophase; I. prions; J. bacteriophage; K. nucleosides; L. cytokinesis

Task III.11

- The structural and functional unit of the kidney … E
- The protein that transports oxygen … C
- The cell division phase during which chromosomes align at the equatorial plane … A
- The hormone that lowers blood glucose … H
- The vessel that carries blood away from the heart … B
- The organelle responsible for ATP production … F

A. metaphase; B. artery; C. hemoglobin; D. neuron; E. nephron; F. mitochondrion; G. anaphase; H. insulin; I. vein; J. alveolus; K. ribosome; L. adrenaline

Task III.12

- The enzyme that unwinds DNA during replication … F
- The part of the eye that contains photoreceptors … B
- The chamber of the heart that pumps blood to the lungs … A
- The membrane covering the lungs … D
- The process of tRNA synthesis … C
- The cell that performs phagocytosis … L

A. right ventricle; B. retina; C. transcription; D. pleura; E. platelets; F. helicase; G. NK-cell; H. iris I. translation; J. left ventricle; K. pericardium; L. macrophage

Task III.13

- The structure connecting the two cerebral hemispheres … A
- The enzyme active in the stomach that digests proteins … F
- The smallest blood vessels … B
- The molecule carrying amino acids to ribosomes … C
- The organ that produces bile … D
- The phase following anaphase … E

A. corpus callosum; B. capillaries; C. tRNA; D. liver; E. telophase; F. pepsin; G. trypsin; H. arterioles; I. pons; J. rRNA; K. gray matter; L. metaphase

Task III.14

- The valve between left atrium and left ventricle … B
- The pigment giving color to skin … H
- The site of gas exchange in the lungs … A
- Enzyme synthesizing mRNA … I
- Structure holding chromatids together … G
- The connective tissue connecting muscle to bone … D

A. alveolus; B. mitral valve; C. DNA polymerase; D. tendon; E. cartilage; F. tricuspid valve; G. centromere; H. melanin; I. RNA polymerase; J. bronchi; K. melatonin; L. telomere

Task III.15

- The last phase of mitosis … E
- The brain structure coordinating body movements … B
- The tube carrying urine from kidney to bladder … A
- A hormone produced by the pancreas … H
- The part of the neuron conducting impulses away from the cell body … C
- Parasitic viruses in bacteria … J

A. ureter; B. cerebellum; C. axon; D. dendrites; E. telophase; F. thyroxine; G. progesterone; H. insulin; I. diencephalon; J. phages; K. metaphase urethra; L. viroids

Task III.16

- The cell organelle that modifies and packages proteins … D
- The phase during which the mitotic spindle is formed … B
- Muscle that extends the lower leg … C
- The hormone produced by the adrenal medulla … A
- Structural carbohydrate in plant cell walls … F
- The structure that prevents food entering the trachea … E

A. adrenaline; B. prophase; C. quadriceps; D. Golgi apparatus; E. epiglottis; F. cellulose; G. insulin; H. glycogen; I. lysosomes; J. metaphase; K. calf muscle; L. pharynx

Task III.17

- The part of the heart that receives blood from the lungs … A
- The enzyme that breaks down starch in saliva … F
- Time-period during which crossing-over does occur … E
- Organelles containing hydrolytic enzymes … D
- The molecule that leaves the nucleus carrying genetic information … C
- Supramolecular complex of DNA and proteins … B

A. left atrium; B. chromatin; C. mRNA; D. lysosomes; E. prophase I; F. amylase; G. lipase; H. peroxisomes; I. anaphase I; J. ribosome; K. tRNA; L. right atrium

Task III.18

- The blood protein essential for clotting … C
- The white outer layer of the eyeball … A
- The process producing haploid cells … B
- The organ storing bile … E
- The structure where rRNA is synthesized … D
- The cell without a nucleus in humans … F

A. sclera; B. meiosis; C. fibrinogen; D. nucleolus; E. gallbladder; F. erythrocyte; G. mitosis; H. neuron; I. cytoplasm; J. cornea; K. hemoglobin; L. liver

Task III.19

- The main site of absorption in the digestive tract … F
- The hormone maintaining pregnancy … C
- Protein with contractile function … B
- The structure connecting sister chromatids … A
- The enzyme synthesizing RNA from DNA … D
- The vessel returning blood to the heart … E

A. centromere; B. myosin; C. progesterone; D. RNA polymerase; E. vein; F. small intestine; G. artery; H. DNA polymerase; I. folliculin; J. telomeres; K. keratin; L. large intestine

Task III.20

- Produces ATP … C
- The phase when sister chromatids separate … A
- The structure increasing mitochondrial surface area … D
- Template for new DNA strand … F
- The enzyme digesting fats … B
- The tube connecting pharynx and stomach … E

A. anaphase; B. lipase; C. mitochondria; D. cristae; E. esophagus; F. single-stranded DNA; G. pepsin; H. single-stranded RNA; I. Golgi apparatus; J. trachea; K. matrix; L. telophase

Task III.21

- The basic unit of nervous system … B
- The membrane surrounding the heart … D
- The organ producing insulin … A
- The enzyme forming peptide bonds during translation … E
- The structure filtering blood in the kidney … C
- Inner lining at the back of the eye … F

A. pancreas; B. neuron; C. glomerulus; D. pericardium; E. peptidyltransferase; F. retina; G. conjunctiva; H. myocardium; I. RNA polimerase; J. liver; K. endocardium; L. renal cortex

Task III.22

- The layer of the heart wall responsible for contraction … C
- The process of DNA duplication … B
- The chamber of the heart that pumps blood to the lungs … F
- The structure that carries impulses toward the neuron cell body … A
- The enzyme active in the small intestine for protein digestion … D
- The part of the ear responsible for hearing … E

A. dendrite; B. replication; C. myocardium; D. trypsin; E. cochlea; F. right ventricle; G. semicircular canals; H. pepsin; I. axon; J. pericardium; K. left ventricle; L. transcription

Task III.23

- Pituitary hyperfunction … D
- The structure that conducts air into the lungs … B
- The cell organelle for intracellular digestion … A
- Enzyme unwinding DNA … F
- The brainstem part controlling breathing … C
- The vessel carrying oxygenated blood from lungs to heart … E

A. lysosome; B. trachea; C. medulla oblongata; D. gigantism; E. pulmonary vein; F. helicase; G. pons; H. polymerase; I. pharynx; J. peroxisomes; K. superior and inferior vena cava; L. diabetes

Task III.24

- The structure that stores sperm and allows maturation … F
- The valve between right atrium and right ventricle … A
- The tissue lining blood vessels … D
- The enzyme that builds phosphodiester bonds in DNA … B
- The immune cells producing antibodies … E
- The eye structure controlling light entry … C

A. tricuspid valve; B. DNA polymerase; C. iris; D. endothelium; E. B-lymphocytes; F. epididymis; G. retina; H. T-lymphocytes; I. DNA phosphatase; J. endocardium; K. mitral valve; L. testicle

Task III.25

- Template for protein synthesis … E
- The phase between two cell divisions … C
- The organ that produces clotting factors … A
- The tube conducting food to the stomach … D
- The receptor cells for balance … F
- The blood cells responsible for immunity … B

A. liver; B. leukocytes; C. interphase; D. esophagus; E. mRNA; F. hair cells (vestibular); G. cochlea; H. platelets; I. pharinx; J. thymus; K. prophase; L. tRNA

Task III.26

- Process of rRNA synthesis … B
- The membrane system for lipid synthesis … C
- The part of the ear responsible for balance … F
- The chamber with the thickest heart wall … A
- The structure separating thorax from abdomen … D
- The organ where urine is formed … E

A. left ventricle; B. transcription; C. smooth endoplasmic reticulum; D. diaphragm; E. kidney; F. semicircular canals; G. cochlea; H. pleura; I. right ventricle; J. translation; K. rough endoplasmic reticulum; L. nephrons

Task III.27

- The blood vessel with valves … E
- The hormone increasing blood calcium … C
- The enzyme in gastric juice … A
- The process reducing chromosome number … B
- The structure connecting muscle fibers to bone … D
- The brain part for conscious activities … F

A. pepsin; B. meiosis; C. parathyroid hormone; D. tendon; E. vein; F. cerebrum; G. cerebellum; H. mitosis; I. trypsin; J. cartilage; K. somatotropic hormone; L. arteries

Task III.28

- The membrane-bound organel with digestive enzymes … C
- The site of urine collection before excretion … F
- Main enzyme of transcription … A
- The cell division of germ cells….H
- The part of the eye focusing light … D
- Vessels carrying blood from heart … I

A. RNA polymerase; B. RNA ligase; C. lysosomes; D. lens; E. mitosis; F. urinary bladder; G. ureter; H. meiosis; I. arteries; J. veinst; K. peroxisomes; L. retina

Task III.29

- The protein forming thin filaments in muscle … D
- The vessel connecting heart to lungs … B
- The cell division producing identical cells … C
- The structure that anchors chromosomes to spindle … A
- Blood cells with a protective function … F
- The part of the nephron where most reabsorption occurs … E

A. centromere; B. pulmonary artery; C. mitosis; D. actin; E. proximal convoluted tubule; F. leukocytes; G. erythrocytes; H. glomerulus; I. miosis; J. telomere; K. keratin; L. aorta

Task III.30

- Outer lining of the lungs … L
- The enzyme that digests carbohydrates in the intestine … A
- The structure connecting brain and spinal cord … C
- The thyroid hormone … E
- Cell division producing haploid cells … I
- The process of movement of water across a membrane … B

A. amylase; B. osmosis; C. brainstem; D. endocytosis; E. thyroxine; F. endocytosis; G. insulin; H. mitosis; I. meiosis; J. spinal column oxytocin; K. lipase; L. pleura

Task III.31

- The functional unit of the kidney … C
- The site of oxygen exchange in the lungs … L
- The pigment responsible for skin color … H
- Template for protein synthesis … E
- The chamber of the heart that receives blood from the lungs … A
- The phase following anaphase … F

A. left atrium; B. bronchial tree; C. nephron; D. melatonin; E. mRNA; F. telophase; G. metaphase; H. melanin; I. neuron; J. right atrium; K. DNA; L. alveolus

Task III.32

- The layer of the skin that contains blood vessels … D
- The molecule that carries amino acids to ribosomes … L
- The hormone that lowers blood glucose … H
- The structure connecting two hemispheres of the brain … A
- The main protein of muscle contraction … E
- Cell organelles containing starch … K

A. corpus callosum; B. rRNA; C. chloroplasts; D. dermis; E. actin; F. epidermis; G. adrenaline; H. insulin; I. myelin; J. gray matter; K. leucoplasts; L. tRNA

Task III.33

- The valve between left atrium and left ventricle … L
- The enzyme that digests proteins in the stomach … H
- The structure that protects the spinal cord … E
- The process of mRNA synthesis … A
- RNA-containing organelle … D
- The cell type that performs phagocytosis … F

A. transcription; B. tricuspid valve; C. replication; D. nucleolus; E. vertebral canal; F. macrophage; G. platelets; H. pepsin; I. trypsin; J. lysosomes; K. sternum; L. mitral valve

Task III.34

- The part of the neuron that conducts impulses away from the cell body … K
- The hormone that increases heart rate in stress … G
- The enzyme that breaks down starch … A
- Supramolecular complex of rRNA and proteins … E
- The smallest blood vessels … F
- The organ where bile is stored … B

A. amylase; B. gallbladder; C. dendrites; D. liver; E. ribosomes; F. capillaries; G. adrenaline; H. insulin; I. veins; J. lipase; K. axon; L. nucleus

Task III.35

- The phase in which sister chromatids separate … G
- The connective tissue that connects muscle to bone … D
- The enzyme that unwinds DNA during replication … F
- Supramolecular complex of phospholipids and proteins … B
- The blood cells that transport oxygen … E
- The part of the eye that contains photoreceptors … C

A. telophase; B. cell membrane; C. retina; D. tendon; E. erythrocytes; F. helicase; G. anaphase; H. iris; I. platelet; J. vitamin A; K. DNA polimerase; L. cartilage

Task III.36

- The hormone of the thyroid gland … F
- The chamber of the heart that pumps blood to the body … J
- The site where sperm are stored and mature … E
- The membrane that lines the lung … H
- The last phase of mitosis … I
- Key component of all cell membranes … L

A. right ventricle; B. adrenaline; C. peritoneum; D. glycogen; E. epididymis; F. thyroxine; G. testicle; H. pleura; I. telophase; J. left ventricle; K. metaphase; L. phospholipids

Task III.37

- The blood protein responsible for clot formation … B
- The part of the brain responsible for coordination … F
- The tube that carries urine from kidney to bladder … C
- The cell organelle for ATP production … A
- Protein with contractile function … E
- Contains linear DNA … D

A. mitochondrion; B. fibrinogen; C. ureter; D. nucleus; E. myosin; F. cerebellum; G. antibody; H. pons; I. axon; J. urethra; K. Golgi apparatus; L. ribosome

Task III.38

- The receptor that detects light … E
- The vessel that returns blood to the heart … A
- Organelle that modifies and packages proteins … H
- The part of the ear responsible for balance … F
- The enzyme that synthesizes RNA from DNA … B
- The structure that separates thorax from abdomen … D

A. vein; B. RNA polymerase; C. endoplasmic reticulum; D. diaphragm; E. rod cell; F. semicircular canals; G. insulin; H. Golgi apparatus; I. cochlea; J. DNA polymerase; K. arteries; L. iris

Task III.39

- The tissue that lines blood vessels … A
- The organ that produces bile … D
- The phase where chromosomes align in the equatorial plane … B
- The molecule that carries genetic information out of the nucleus … F
- Part of throat behind oral cavity … C
- The structure that prevents food entering the trachea … E

A. endothelium; B. metaphase; C. pharynx; D. liver; E. epiglottis; F. mRNA; G. larynx; H. anaphase; I. endocard; J. endocardium; K. tRNA; L. gallbladder

Task III.40

- The blood cells responsible for immune defense … E
- The part of the eye that controls light entry … B
- The enzyme that digests fats … F
- The structure that connects muscle fibers to bone … A
- Template for new DNA strand … C
- Template for translation … G

A. tendon; B. iris; C. single-stranded DNA; D. adrenaline; E. leukocytes; F. lipase; G. mRNA; H. cornea; I. pons; J. retina; K. cartilage; L. platelets

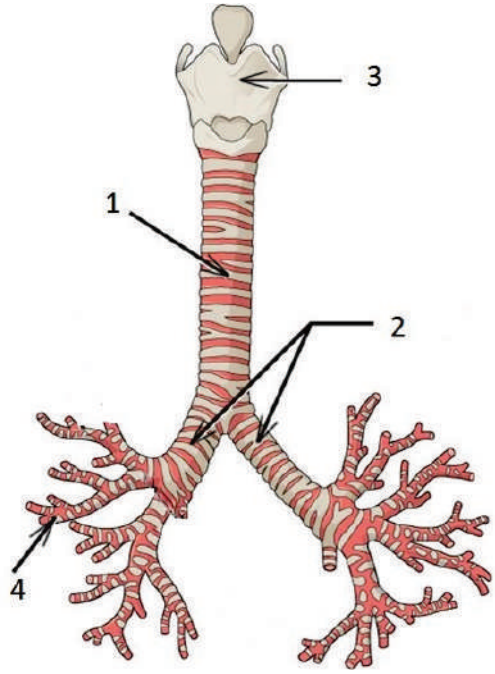
IV. Label the figures

*(Note: the right answers are given in **Bold**)*

Task IV.1. Label the numbered parts of the figure using the given options (A) and select the correct answers (B, C)

A.

1 → Trachea
2 → Primary bronchi
3 → Larynx
4 → Bronchioles
Pharynx
Alveoli
Lungs
Spleen



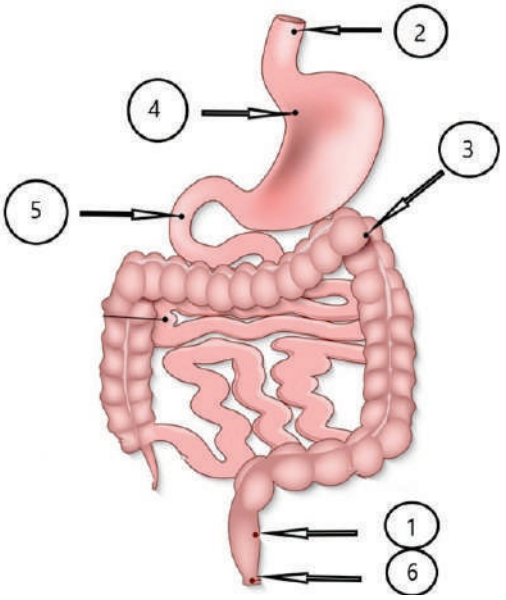
B. Which is the largest cartilage of the larynx?

a) Cricoid
b) Epiglottis
c) **Thyroid**
d) Arytenoid
e) Cuneiform

C. How are the thin-walled sacs called in which bronchioles terminate?

a) Bronchi
b) Capillaries
c) **Alveoli**
d) Pleura

Task IV.2. Label the numbered parts of the figure using the given options

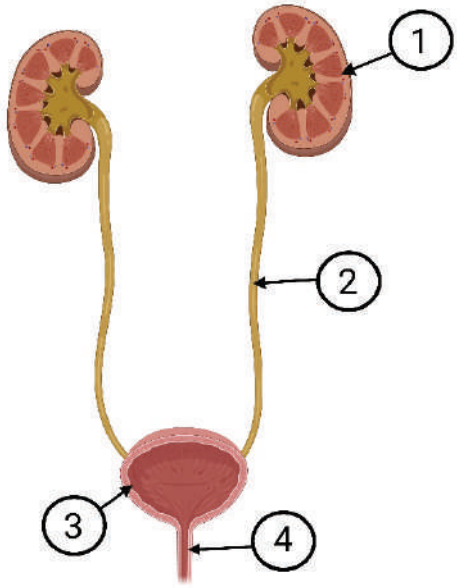


1 → Rectum
2 → Esophagus
3 → Large intestine
4. → Stomach
5 → Duodenum
6 → Anus
Tongue
Larynx
Pharynx
Liver
Lungs
Spleen

Task IV.3. Label the numbered parts of the figure using the given options (A) and select the correct answers (B, C)

A.

1 → Kidney
2 → Ureter
3 → Urinary bladder
4 → Urethra
Renal vein
Gall bladder
Intestine
Aorta

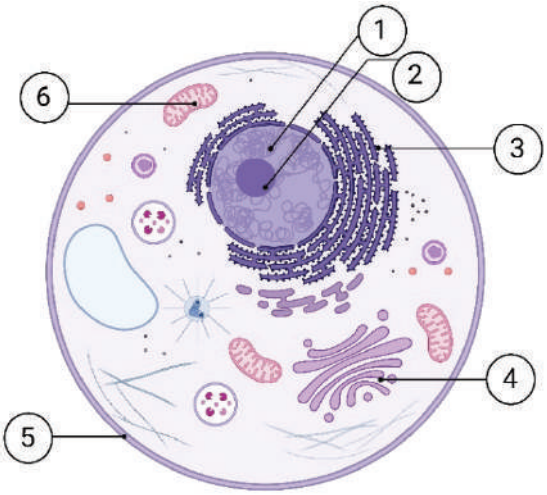


B. What is the functional unit of the kidney where filtration occurs?
a) Neuron
b) Alveolus
c) **Nephron**
d) Glomerulus

C. Which blood vessels carry blood to the kidneys for filtration?

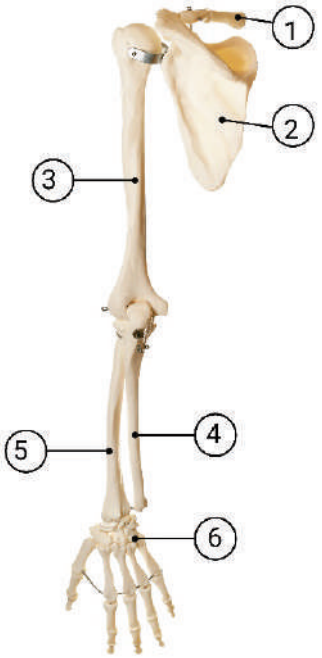
a) Renal veins
b) Capillaries
c) Portal veins
d) **Renal arteries**

Task IV.4. Label the numbered parts of the figure using the given options



1 → Nucleus
2 → Nucleolus
3 → Rough endoplasmic reticulum
4 → Golgi apparatus
5 → Plasma membrane
6 → Mitochondrion
Smooth endoplasmic reticulum
Ribosomes
Lysosomes
Peroxisomes
Centrioles (centrosome)
Vacuole

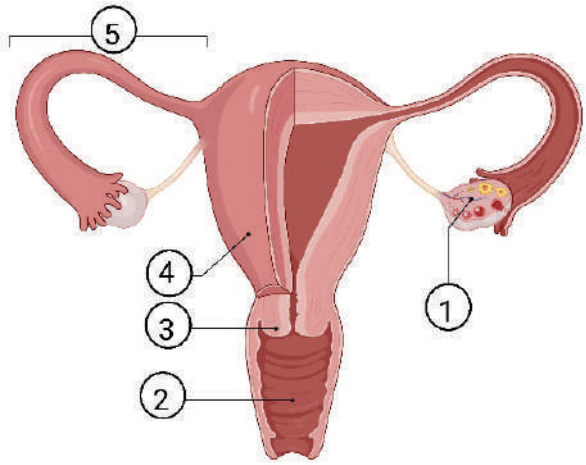
Task IV.5. Label the numbered parts of the figure using the given options



1 → Clavicle
2 → Scapula/Shoulder blade
3 → Humerus/Upper arm bone
4 → Ulna
5 → Radius
6 → Wrist (Carpals)
Femur / Thigh bone
Patella / Kneecap
Tibia
Fibula
Ankle bones
Midfoot bones
Toe bones

Task IV.6. Label the numbered parts of the figure using the given options (A) and select the correct answer (B)

A.



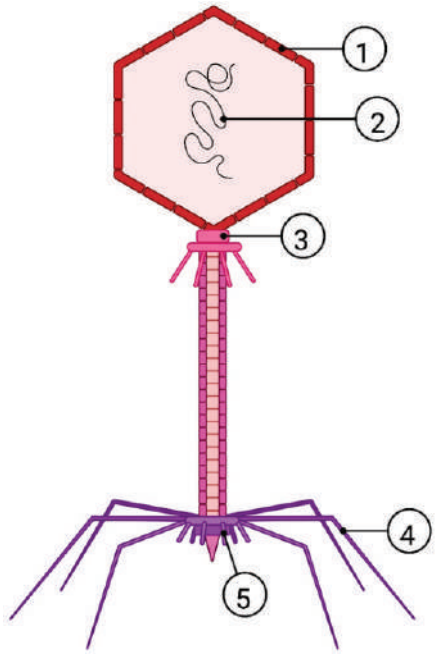
1 → Ovary
2 → Vagina
3 → Cervix
4 → Uterus (Womb)
5 → Fallopian tube (Oviduct)
Clitoris
Labia
Urethra
Prostate
Kidney

B. During which process is the egg released from the ovary?

a) Fertilization
b) **Ovulation**
c) Menstruation
d) Implantation

Task IV.7. Label the numbered parts of the figure using the given options (A) and select the correct answer (B)

A.



1 → Capsid head
2 → Nucleic acid
3 → Collar
4 → Tail fibers
5 → Spikes (Base plate)
Circular DNA
Plasmid
Cell wall
Mitochondria
RNA

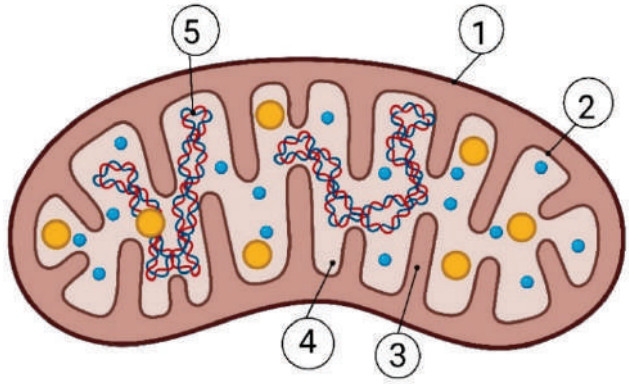
B. What is presented?

a) Bacteria
b) **Bacteriophage**
c) HIV
d) Coronavirus

Task IV.8. Label the numbered parts of the figure using the given options (A) and select the correct answer (B)

A.

1 → Outer membrane
2 → Inner membrane
3 → Cristae
4 → Matrix
5 → DNA
Ribosomes
Centriole
Vacuole
Lysosome
Nucleus



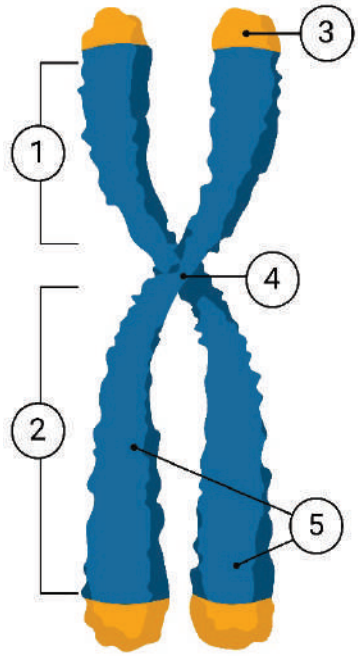
B. What is presented?

a) Chloroplast
b) Endoplasmic reticulum
c) Golgi apparatus
d) **Mitochondrion**

Task IV.9. Label the numbered parts of the figure using the given options (A) and select the correct answer (B)

A.

1 → Short arm
2 → Long arm
3 → Telomere
4 → Centromere
5 → Sister chromatids
Zygote
Nucleolus
Centriol
Centrosome
Chromatin

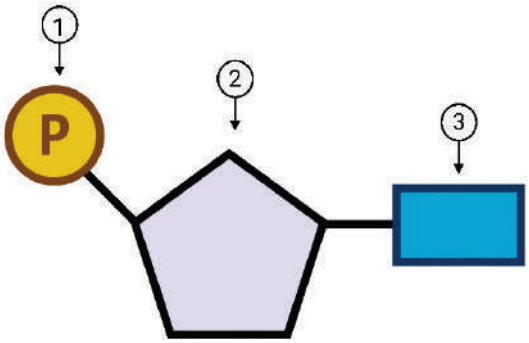


B. What is presented?

a) Chromatin
b) **Chromosome**
c) Centriole
d) Ribosome

Task IV.10. Label the numbered parts of the figure using the given options (A) and select the correct answers (B, C, D)

A. Label each component of the molecule:



1 → Phosphate group
2 → Pentose sugar
3 → Nitrogenous base
hexose sugar
DNA
RNA

B. Specify the name of this molecular structure?
a) **Nucleotide**
b) Protein
c) Lipid
d) Polysaccharide

C. Which component forms the backbone of DNA and RNA?
a) Nitrogenous base
b) **Phosphate group + Pentose sugar**
c) Amino acid
d) Lipid

D. Which nitrogenous base pairs with Adenine in RNA?
a) Cytosine
b) Thymine
c) Guanine
d) **Uracil**

V. Compare

V.1. Feature / Question	Prokaryotic cell	Eukaryotic cell
Can divide by mitosis	No	Yes
Contains DNA	Yes	Yes
DNA organized as chromatin	No	Yes
Has plasmids	Yes	No

V.2. Feature / Question	Prokaryotic Cell	Eukaryotic Cell
Has membrane-bound nucleus	No	Yes
Has mitochondria	No	Yes
Has ribosomes	Yes	Yes
Has lysosomes	No	Yes

V.3. Feature / Question	Transcription	Translation
Uses DNA as a template	Yes	No
Building blocks are amino acids	No	Yes
Main enzyme is RNA polymerase	Yes	No
End product is RNA	Yes	No

V.4. Feature / Question	Transcription	Translation
Uses mRNA as a template	No	Yes
Building blocks are ribonucleotides	Yes	No
Main enzymatic activity is provided by peptidyl-transferase	No	Yes
End product is protein	No	Yes

V.5. Feature / Question	DNA	RNA
Contains deoxyribose	Yes	No
Has thymine as a nitrogen base	Yes	No
Has uracil as a nitrogen base	No	Yes
High stability	Yes	No

V.6. Feature / Question	DNA	RNA
Contains ribose	No	Yes
Has adenine as a nitrogen base	Yes	Yes
Has guanine as a nitrogen base	Yes	Yes
Is made by nucleotides	Yes	Yes

V.7. Feature / Question	Interphase	Metaphase
Mitotic spindle is present	No	Yes
Chromosomes are decondensed and uncoiled	Yes	No
Chromosomes are aligned at the spindle equator	No	Yes
DNA replication occurs	Yes	No

V.8. Feature / Question	Interphase	Metaphase
Chromosomes are highly condensed and supercoiled	No	Yes
Chromosomes are irregularly scattered	Yes	No
Chromosomes are aligned at the spindle equator	No	Yes
DNA replication occurs	Yes	No

V.9. Feature / Question	Prophase	Telophase
The genetic material is doubled	Yes	No
Nuclear envelope is intact	No	Yes
Mitotic spindle is disassembling	No	Yes
It is followed by cytokinesis	No	Yes

V.10. Feature / Question	Prophase	Telophase
Chromosomes are highly condensed	Yes	No
Nuclear envelope is breaking down	Yes	No
Nucleolus is visible	No	Yes
Mitotic spindle is forming	Yes	No

V.11. Feature / Question	Mitosis	Meiosis
Typical for somatic cells	Yes	No
Involves recombination	No	Yes
Produces genetically different cells	No	Yes
Produces diploid daughter cells	Yes	No

V.12. Feature / Question	Mitosis	Meiosis
Typical for germ cells	No	Yes
Produces haploid daughter cells	No	Yes
Crossing over occurs	No	Yes
Single cell division	Yes	No

V.13. Feature / Question	Blood group A	Blood group B	Blood group AB	Blood group O
Has A antigen on erythrocytes	Yes	No	Yes	No
Has anti-A antibodies in plasma	No	Yes	No	Yes

V.14. Feature / Question	Blood group A	Blood group B	Blood group AB	Blood group O
Has B antigen on erythrocytes	No	Yes	Yes	No
Has anti-B antibodies in plasma	Yes	No	No	Yes

V.15. Feature / Question	Nucleic acids	Proteins
Made of nucleotides	Yes	No
Monomers are joined by peptide bonds	No	Yes
Molecule of inheritance	Yes	No
Synthesized by polymerases	Yes	No

V.16. Feature / Question	Nucleic acids	Proteins
Made of amino acids	No	Yes
Monomers are joined by phosphodiester bonds	Yes	No
Have structural, regulatory and transport functions	Yes	Yes
Can be structural components of ribosomes	Yes	Yes

V.17. Feature / Question	Replication	Transcription
DNA serves as a template	Yes	Yes
Building blocks are ribonucleotides	No	Yes
Main enzyme is DNA polymerase	Yes	No
Final product is RNA	No	Yes

V.18. Feature / Question	Replication	Transcription
Uses RNA as a template	No	No
Building blocks are deoxyribonucleotides	Yes	No
Main enzyme is RNA polymerase	No	Yes
Final product is DNA	Yes	No

V.19. Feature / Question	Plant Cell	Animal Cell
The cell wall is present	Yes	No
Has large central vacuole	Yes	No
Stores energy as glycogen	No	Yes
Performs photosynthesis	Yes	No

V.20. Feature / Question	Plant Cell	Animal Cell
Chloroplasts are present	Yes	No
Peroxisomes are present	Yes	Yes
Stores energy as starch	Yes	No
Has plasmids (extra-chromosomal DNA)	No	No

V.21. Feature / Question	Somatic Cells	Gametes
Has diploid chromosome number	Yes	No
Formed by meiosis	No	Yes
Genetically identical to parent cell	Yes	No
Found in body tissues	Yes	No

V.22. Feature / Question	Somatic Cells	Gametes
Has haploid chromosome number	No	Yes
Formed by mitosis	Yes	No
Genetically different from parent cell	No	Yes
Function in reproduction	No	Yes

V.23. Feature / Question	Exocrine glands	Endocrine glands
Secrete products through ducts	Yes	No
Secrete products directly into blood	No	Yes
Examples include sweat and salivary glands	Yes	No
Examples include thyroid and adrenal glands	No	Yes

V.24. Feature / Question	mRNA	tRNA
Carries genetic code from DNA	Yes	No
Brings amino acids to ribosome	No	Yes
Forms ribosome structure	No	No
Has anticodon	No	Yes

V.25. Feature / Question	tRNA	rRNA
Forms ribosome structure	No	Yes
Synthesized by RNA polymerase	Yes	Yes
Directly translated into protein	No	No
Found in cytoplasm	Yes	Yes

V.26. Feature / Question	Bacteria	Virus
Cellular structure	Yes	No
Can reproduce alone	Yes	No
Has metabolism	Yes	No
Contains genetic material	Yes	Yes

V.27. Feature / Question	Bacteria	Plant cell
Prokaryotic	Yes	No
Eukaryotic	No	Yes
Has nucleus	No	Yes
Can form spores	Yes	No

V.28. Feature / Question	Thyroid gland	Adrenal gland
Produces hormones	Yes	Yes
Controls metabolism	Yes	Yes
Responds to stress	No	Yes
Located in the neck	Yes	No
Regulated by pituitary gland	Yes	Yes

V.29. Feature / Question	Euchromatin	Heterochromatin
Contains many genes	Yes	No
Stains darkly with dyes	No	Yes
Found near the nuclear membrane	No	Yes
Contains DNA	Yes	Yes

V.30. Feature / Question	Euchromatin	Heterochromatin
Lightly packed	Yes	No
Highly condensed	No	Yes
Transcriptionally active	Yes	No
Transcriptionally inactive	No	Yes

V.31. Feature / Question	Codon	Anticodon
Found on mRNA	Yes	No
Found on tRNA	No	Yes
3 nucleotides long	Yes	Yes
Codes for amino acid	Yes	No

V.32. Feature / Question	Rough endoplasmic reticulum	Smooth endoplasmic reticulum
Has ribosomes	Yes	No
Synthesizes proteins	Yes	No
Synthesizes lipids	No	Yes
Detoxification	No	Yes

V.33. Feature / Question	Passive Transport	Active Transport
Requires ATP	No	Yes
Moves against gradient	No	Yes
Diffusion included	Yes	No
Uses pumps	No	Yes

V.34. Feature / Question	Endocytosis	Exocytosis
Moves material into cell	Yes	No
Moves material out of cell	No	Yes
Uses vesicles	Yes	Yes
Requires ATP	Yes	Yes

V.35. Feature / Question	Artery	Vein
Carries blood away from heart	Yes	No
Carries blood to heart	No	Yes
Thick muscular walls	Yes	No
Has valves	No	Yes

V.36. Feature / Question	Red Blood Cells	White Blood Cells
Has nucleus	No	Yes
Transports oxygen	Yes	No
Involved in immunity	No	Yes
Contain hemoglobin	Yes	No

VI. Find and correct the 5 errors in the texts by using the given options

*(Note: the right answers are given in **Bold**)*

VI.1. The vertebral column consists of 26 vertebrae. It is divided into cervical, thoracic, shoulder and sacral regions. Each vertebra has a body, an arc and processes. Between the body and the arc a joint is formed. The first and the last vertebrae differ in structure and type of joining. Between neighboring vertebrae there are intervertebral plaques.

Option	Replacement
1.	**26 vertebrae → 24 vertebrae**
2.	**shoulder → lumbar**
3.	**joint → opening**
4.	**last → second**
5.	**plaques → discs**
6.	cervical → cranial
7.	body → head
8.	sacral → coccygeal
9.	joint → ligaments
10.	arc → rib

VI.2. Disease agents consisting of only "naked" RNA are known as viruses. They contain double stranded RNA molecules. They invade animal cells only. Another type of infections agents, prions, are composed of DNA molecules only. They cause diseases because of changes in their primary structure.

Option	Replacement
1.	**viruses → viroids**
2.	**double stranded → single stranded**
3.	**animal → plant**
4.	**DNA → protein**
5.	**primary → secondary structure**
6.	RNA → DNA
7.	prions → bacteria
8.	infectious → harmless
9.	naked → coated
10.	animal → fungal

VI.3. Arteries are blood vessels that carry blood to the heart. They have small diameters and elastic walls. They branch into narrower vessels called venules which branch further into capillaries. Blood is pumped out of the heart under pressure into the vena cava and the cardiac artery.

Option	Replacement
1.	**to the heart → out of the heart**
2.	**small → large**
3.	**venules → arterioles**
4.	**cardiac → pulmonary**
5.	**vena cava → aorta**
6.	capillaries → veins
7.	cardiac artery → cardiac veins
8.	arteries → capillaries
9.	blood → lymph
10.	heart → lungs

VI.4. Innate immunity is the first line of defense. Its protective barrier function is carried out by the liver. Its cells are able to engulf and destroy bacteria. Innate immunity provides specific defense against bacteria and viruses. It is evolutionary the youngest defense system of the body. The basic cells involved in innate immunity able of engulfing pathogens are lymphocytes. Innate immunity is activated after the adaptive immune response begins.

Option	Replacement
1.	**liver → skin**
2.	**specific → nonspecific**
3.	**the youngest → the oldest**
4.	**lymphocytes → phagocytes**
5.	**activated after → activated before**
6.	bacteria → plants
7.	cells → tissues
8.	engulf → excrete
9.	defense → attack
10.	evolutionary → anatomically

VI.5. Sex glands produce gametes and sex enzymes. The male reproductive organs include sperm ducts, seminal vacuoles and the prostate gland. The female organs are the oval glands, uterus and vagina. The process of fertilization of the egg by the sperm takes place in the uterus. The embryo implants in the ovary.

Option	Replacement
1.	**enzymes → hormones**
2.	**vacuoles → vesicles**
3.	**oval glands → ovaries**
4.	**uterus → Fallopian tube**
5.	**ovary → uterus**
6.	sperm ducts → testosteron
7.	vagina →pancreas
8.	prostate → seminal gland
9.	fertilization → implantation
10.	gametes → hormones

VI.6. The digestive system in humans is closed. Its major organs are the oral cavity, the pharynx, the stomach and the intestines. Saliva causes the mechanical digestion of food. The tongue is an epithelial organ that moves voluntarily. It forms and moves the bolus and participates in speaking. The tasting of food is due to receptors in the oesophagus. The stomach absorbs most nutrients directly into the blood.

Option	Replacement
1.	**closed → open**
2.	**mechanical → chemical**
3.	**epithelial → muscular**
4.	**oesophagus → tongue**
5.	**absorbs → does not absorb**
6.	intestines → spleen
7.	mechanical → physical
8.	saliva → bile
9.	pharynx → larynx
10.	oral cavity → teeth

VI.7. Proteins are composed of 10 different types of amino acids. Therefore, proteins are heteropolymers. The covalent bond, formed between amino acids, is called a phosphodiester bond. Polypeptide chains are straight and branched. The folding of the polypeptide chain into a uniform spiral or into a beta sheet shape is recognized as the tertiary structure of proteins. The primary structure of the proteins is determined by the order of the peptides.

Option	Replacement
1.	**10 → 20**
2.	**phosphodiester → peptide**
3.	**branched → unbranched**
4.	**tertiary → secondary**
5.	**peptides → amino acids**
6.	beta sheet → alpha helix
7.	polypeptide → nucleotide
8.	heteropolymers → homopolymers
9.	amino acids → monosaccharides
10.	spiral → linear

VI.8. The heart is a muscular organ which pumps blood into the lymphatic vessels. Longitudinally, a septum divides the heart into right and left parts. In each part there is an atrium and a tendon. The heart walls are built up of two layers. The inner layer of the heart wall is made up of a simple squamous epithelium and is called ectocardium. The heart is surrounded by the myocardium.

Option	Replacement
1.	**lymphatic → blood**
2.	**tendon → ventricle**
3.	**two → three**
4.	**ectocardium → endocardium**
5.	**myocardium → pericardium**
6.	atrium → aorta
7.	simple squamous → cuboidal
8.	muscular → epithelial
9.	longitudinally → transversely
10.	septum → membrane

VI.9. The sequence of cell growth, its preparation for division and the division into two daughter cells is called mitosis. The most important process in preparation for mitosis is the doubling of genetic material – production of RNA. During interphase the cell decreases in mass by synthesis of diverse proteins. In result of mitosis from one diploid mother cell 4 daughter cells are formed. Cytokinesis occurs before DNA replication.

Option	Replacement
1.	**mitosis → cell cycle**
2.	**RNA → DNA**
3.	**decreases → increases**
4.	**4 → 2**
5.	**before → after**
6.	interphase → prophase
7.	daughter → mother
8.	diploid → haploid
9.	proteins → chromatids
10.	preparation → termination

VI.10. The process of RNA synthesis is called replication. There are three types of RNA present in every cell – messenger (mRNA), transfer (tRNA) and ribosomal (rRNA). rRNA is a double stranded molecule that builds up the ribosomes. tRNA binds the amino acid and transfers it to the corresponding anticodon on mRNA. Peptides are bound to each other by phosphodiester bonds. Translation takes place in the nucleus.

Option	Replacement
1.	**replication → transcription**
2.	**double → single**
3.	**anticodon → codon**
4.	**phosphodiester → peptide**
5.	**nucleus → cytoplasm**
6.	rRNA → gRNA
7.	mRNA → miRNA
8.	ribosomes → mitochondria
9.	amino acids → nucleotides
10.	three → two

VI.11. The nucleolus is the control center of the cell where DNA is stored and replicated. Mitochondria are single-membrane bound organelles which generate energy through cellular respiration and are responsible for the production of ATP. Peroxisomes contain hydrolytic enzymes which help in the destruction of damaged cells and pathogens. The nucleus is the place where proteins are synthesized. Flagella are specialized cellular structures which help digestion.

Option	Replacement
1.	**Nucleolus → nucleus**
2.	**Single-membrane → double-membrane**
3.	**Peroxisomes → lysosomes**
4.	**Nucleus → ribosomes**
5.	**Digestion → movement**
6.	Organelles → vesicles
7.	ATP → CO_2
8.	Hydrolytic → lipophylic
9.	Enzymes → hormones
10.	Specialized → non-specialized

VI.12. The kidneys are digestive organs responsible for the production of urine. They are located in the thoracic cavity, behind the stomach. The structural and functional unit of the kidney is the nephrite. The kidneys are covered with an epithelial capsule that is important for their attachment and protection from injury and stress. Urine is stored in the ureter.

Option	Replacement
1.	**digestive → excretory**
2.	**thoracic → abdominal**
3.	**nephrite → nephron**
4.	**epithelial → fatty**
5.	**ureter → urinary bladder**
6.	stomach → spleen
7.	capsule → membrane
8.	urine → blood
9.	kidneys → lungs
10.	production → storage

VI.13. RNA is made up of four types of deoxyribonucleotides. It is synthesized in the nucleus from a DNA template. It usually exists as a double-stranded molecule in the cells. The bond connecting nucleotides along the strand is called a hydrogen bond. Depending on its sequence, RNA can fold into complex shapes forming a tertiary structure that affects its function. tRNA acts as a template for protein synthesis.

Option	Replacement
1.	**deoxyribonucleotides → ribonucleotides**
2.	**double-stranded → single-stranded**
3.	**hydrogen → phosphodiester**
4.	**tertiary → secondary**
5.	**tRNA → mRNA**
6.	nucleus → cytoplasm
7.	nucleus → Golgi complex
8.	four → five
9.	hydrogen → peptide
10.	cells → Golgi complex

VI.14. Enzymes are lipids that speed up chemical reactions. Enzymes are used up during reactions. Each enzyme works on many different substrates. Enzymes work best at any temperature. The place where the substrate binds is called the ribosome.

Option	Replacement
1.	**lipids → proteins**
2.	**used up → not used up**
3.	**many different → one specific**
4.	**any → optimal**
5.	**ribosome → active site**
6.	ribosome → main site
7.	substrate → product
8.	temperature → pressure
9.	reactions → cells
10.	lipids → sugars

VI.15. The cell membrane is made up of proteins and nucleic acids. It is impermeable to all substances. Its structure is described by the fluid mosaic model. The membrane controls what enters and leaves the nucleus. The membrane is found only in animal cells. It contains cholesterol in plant cells.

Option	Replacement
1.	**nucleic acids → lipids**
2.	**impermeable → selectively permeable**
3.	**nucleus → cell**
4.	**only in animal cells → in all cells**
5.	**plant → animal**
6.	mosaic → rigid
7.	fluid → solid
8.	membrane → wall
9.	controls → stops
10.	substances → energy

VI.16. Ribosomes are membrane-bound organelles. They are found only in eukaryotic cells. Their function is protein synthesis. They are made up of DNA and proteins. Ribosomes are composed of large and extra-large subunits. They translate tRNA directly.

Option	Replacement
1.	**membrane-bound → non-membrane-bound**
2.	**only in eukaryotic → in all cells**
3.	**DNA → rRNA**
4.	**extra-large → small**
5.	**tRNA → mRNA**
6.	tRNA → rRNA
7.	proteins → carbohydrates
8.	only in eukaryotic → in bacteria
9.	translate → replicate
10.	subunits → vesicles

VI.17. Chromosomes are found in the cytoplasm. They are made up of RNA and proteins. Their structure and number are the same in all species. They become visible during interphase. Humans have 23 chromosomes in somatic cells. They carry hereditary information.

Option	Replacement
1.	**cytoplasm → nucleus**
2.	**RNA and proteins → DNA and proteins**
3.	**same → different**
4.	**interphase → mitosis**
5.	**23 → 46**
6.	hereditary → metabolic
7.	cells → tissues
8.	humans → plants
9.	chromosomes → chromatids
10.	visible → countable

VI.18. Meiosis produces two non-identical diploid cells. It occurs in somatic cells. It consists of one division. Homologous chromosomes separate in meiosis I. Crossing over increases genetic similarity. Meiosis is used for the formation of gametes.

Option	Replacement
1.	**two → four**
2.	**diploid → haploid**
3.	**somatic → germ**
4.	**one → two**
5.	**similarity → diversity**
6.	meiosis II → metaphase I
7.	non-identical → chomologus
8.	gametes → somatic cells
9.	chromosomes → chromatins
10.	gametes → neurons

VI.19. Blood is a type of connective tissue. It consists of plasma and stroma. Red blood cells contain a nucleus. White blood cells transport oxygen. Platelets are responsible for immunity. Blood clotting prevents blood loss. Blood is produced in the liver.

Option	Replacement
1.	**stroma → formed elements**
2.	**contain → do not contain**
3.	**transport oxygen → fight infections**
4.	**immunity → blood clotting**
5.	**liver → bone marrow**
6.	platelets → erythrocytes
7.	plasma → lymph
8.	clotting → digestion
9.	nucleus → nucleolus
10.	stroma → enzymes

VI.20. Neurons are epithelial cells. They transmit chemical impulses. A neuron consists of a cell body, dendrites and axon. Dendrites carry impulses away from the cell body. Axons are usually short fibers of the neuron. Axons are connections between neurons or between a neuron and another cell.

Option	Replacement
1.	**epithelial → nerve**
2.	**chemical → nerve**
3.	**away from → toward**
4.	**short → long**
5.	**axons → synapses**
6.	cell body → cell nucleus
7.	Synapses → nerve cells
8.	impulses → hormones
9.	muscles → adipose tissue
10.	cell body → cell membrane

VI.21. The human skeleton consists of 106 bones. Its main functions are protection, support and movement. Bones are connected by joints, tendons and muscles. The bone marrow, located in some bones, produces hormones. The skull protects the spinal cord. The rib cage protects the kidneys.

Option	Replacement
1.	**106 → 206**
2.	**muscles → ligaments**
3.	**hormones → blood cells**
4.	**spinal cord → brain**
5.	**kidneys → lungs**
6.	kidneys → bladder
7.	skeleton → muscular system
8.	movement → digestion
9.	bones → cartilages
10.	joints → endothelial cells

VI.22. Muscles are built up of connective tissue. There are two types of muscle tissue. Skeletal muscles work involuntarily. The cardiac muscle is found in the stomach. Smooth muscles are striated. A single muscle fiber cannot contract and relax at the same moment.

Option	Replacement
1.	**connective → muscle**
2.	**two → three**
3.	**involuntarily → voluntarily**
4.	**stomach → heart**
5.	**striated → non-striated**
6.	cannot → can
7.	muscles → nerves
8.	connective → epithelial
9.	muscle fiber → nerve fiber
10.	smooth → involuntarily