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BIOLOGY

Multiple-choice questions for the undergraduate admission exam (type 3) for the faculties of Medicine and Dental medicine

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CONTENTS

CHAPTER 1 ▸ Introduction to anatomy and physiology

Cell and cell physiology

1. Select the correct associations referring to the subdivisions of anatomy:
A. Cytology – the study of cells and their functions
B. Developmental anatomy – the study of the structural changes of an individual from fertilization to adulthood
C. Macroscopic anatomy – the study of the structures of the body visible without the use of a microscope
D. Microscopic anatomy – the study of cells, tissues and organs visible under a microscope
E. Reproduction physiology – the study of reproductive organs and methods of reproduction

2. Select the correct statements referring to cytology:
A. It is one of the branches of physiology
B. It is the science that studies the structures of the body visible without the use of a microscope
C. It is the study of cells and their functions
D. It is the study of the excretory system and its functions
E. It studies of the functions of the nervous system and its involvement in human behaviour

3. Select the true statement(s) from the answers below:
A. The function of the excretory system is studied by a branch of physiology called cytology
B. The function of the excretory system is studied by a branch of physiology called renal physiology
C. Reproductive physiology studies the excretory system and its functions
D. Reproductive physiology studies the reproductive organs and the methods of reproduction
E. The function of the nervous system is studied by a branch of physiology called neurophysiology

4. Select the true statement(s) from the answers below:
A. Carbohydrates, proteins, lipids and water are typical examples for the level of structural organisation of the body where the main components are represented by molecules
B. The cell contains subcellular structures such as mitochondria and ribosomes
C. The atom is the fundamental structure of all living organisms
D. Atoms are chemical units of chemical elements (oxygen, carbon, nitrogen, sodium)
E. Carbohydrates, proteins and lipids do not belong to the important molecules of the body, representing just a small percentage of its components

5. Select the true statement(s) from the answers below:
A. An organ consists of two or more types of tissues
B. The stomach consists of all four main types of tissues: epithelial, connective, muscle and nervous
C. A system consists of several organs with different structures but identical functions
D. The muscle system includes striated muscles, smooth muscles and the cardiac muscle
E. The urinary system consists of the kidneys, the bladder and the associated urinary tracts

6. Which of the following statements referring to metabolism is/are true?
A. Metabolism represents the sum of all chemical processes in the body
B. Metabolism consists of a single subcategory, called catabolism
C. Metabolism consists of catabolism, which usually takes up energy in order to synthesize organic matter
D. Metabolism is subdivided into two subcategories, catabolism and anabolism
E. Catabolism represents the decomposition of organic matter resulting in the production of the energy required by cell functioning

7. Select the correct associations referring to body functions:
A. Movement – voluntary or involuntary – is the result of muscle fibre contraction
B. Conductivity – the property of a cell to send stimuli – is characteristic for bone and muscle cells
C. Asexual reproduction – the production of a whole new individual – includes spermatogenesis and oogenesis

D. Sexual reproduction – the division of a single cell – is the generation of two identical daughter cells
E. Conductivity – the property of cells to send stimuli – is a characteristic of nervous and muscle cells

8. Which of the following statements referring to homeostasis are true?
A. All the processes that contribute to maintaining internal stability of the body within normal limits are called homeostasis
B. Homeostasis is not compatible with meeting the nutritional and energetic demands of body cells
C. The constant maintaining of temperature and atmospheric pressure are necessary conditions to maintain homeostasis
D. All organ systems are involved in maintaining homeostasis
E. Various disorders (diseases), excessive temperature, pain or lack of blood oxygen induce external imbalances without impairing the body's internal environment

9. Which of the following statements are true?
A. When the body is in anatomical position, it is in vertical position (orthostatism), with the upper limbs near the body and the palms facing forwards
B. The anatomical position of the body refers to its horizontal position (orthostatism) with the upper limbs away from the body and the palms facing backwards
C. In anatomical position, the body has two sides, an anterior one (ventral) and a posterior one (dorsal)
D. In anatomical position, the body has two sides, a medial one (right) and a lateral one (left)
E. The term „ventral" is the opposite of the term „dorsal" (when the body is viewed frontally)

10. Which of the following statements referring to direction are *false*?
A. In anatomic terminology, the abdomen (the inferior part of the abdominopelvic cavity) is considered to be located inferior to the thorax
B. The term "proximal" refers to a point nearer to where extremities are attached to the body
C. The term "ipsilateral" refers to structures situated on opposite sides of the body
D. The term "contralateral" refers to structures situated on the same side of the body
E. The term "lateral" refers to a position farther from the body's median line

11. Select the correct associations regarding the body's directional terms:
A. The hand – proximal to the forearm – distal to the arm
B. Left hand – right foot– ipsilateral
C. Right hand – right foot – ipsilateral
D. Left arm – right foot – contralateral
E. Foot – distal to thigh – distal to calf

12. Select the true statements referring to the body's anatomical planes:
A. There are three important planes (surfaces): sagittal, frontal, coronal
B. The midsagittal plane is a vertical plane that divides the body in two halves, left and right
C. The frontal plane has a vertical direction and divides the body in an anterior and a ventral part
D. The planes transect the human body and provide reference points for its organs
E. The frontal plane forms a right angle with the coronal plane

13. Which of the following statements referring to body cavities and regions is/are true?
A. The heart, the oesophagus, the trachea and the primary bronchi are located in the mediastinum
B. The abdominopelvic cavity is separated by the thoracic cavity by a large quadrangular muscle (diaphragm)
C. The abdominopelvic cavity is called the peritoneal cavity and contains the internal abdominal and pelvic organs
D. The stomach is located in the abdominal subdivision of the abdominopelvic cavity
E. The umbilical region is situated in the centre of the abdomen, and the epigastric region lies inferior to it

14. Choose the correct statement(s) referring to body cavities and regions:
A. Organs such as the lungs, the heart, the thymus, the oesophagus are situated at the thoracic level
B. The lungs (two in number) are located in the mediastinum
C. The terms „quadrants" (upper – left and right, and lower – left and right) are commonly used in clinical practice

D. The intersection of two imaginary lines, a vertical one and a horizontal one, in the centre of the abdominopelvic cavity delimits four quadrants
E. The spinal canal, delimited by the meninges, contains interstitial fluid

15. Choose the true statement(s) referring to the abdominopelvic cavity:
A. It belongs to the ventral part of the body, together with the thoracic cavity and the spinal canal
B. It is also called peritoneal cavity and contains the internal abdominal and pelvic organs
C. Its abdominal subdivision contains the liver, the stomach, the rectum and the anal canal
D. Is separated by the thoracic cavity by a dome-shaped large muscle – the diaphragm
E. Its pelvic subdivision contains the gallbladder, the jejunum and the ileum

16. Choose the true statement(s) from below:
A. The human body contains three serous membranes: the pleura, the pericardium and the peritoneum
B. Each of the three serous membranes has a parietal and a visceral sheet
C. The parietal sheet of the peritoneum lines the abdominal and the pelvic cavities
D. The parietal sheet of the peritoneum lines only the abdominal cavity
E. The space between the peritoneal sheets is called peritoneal cavity, the space between pericardial sheets is called pericardial cavity

17. Choose the correct statement(s) referring to prokaryote cells:
A. They are devoid of nucleus
B. They divide by mitosis
C. Bacteria are prokaryotic cells
D. They do not divide by mitosis
E. Plants, animals and humans consist of prokaryotic cells

18. Choose the correct statement(s) from below:
A. Prokaryotic cells divide by cytokinesis
B. Eukaryotic cells have a nucleus and cell organelles and divide by mitosis
C. Both prokaryotic and vegetal (plant) cells are devoid of nuclei
D. All cells, including human ones, have two basic components: cytoplasm and plasma membrane
E. Bacteria belong to prokaryotic cells, while animal and human cells are eukaryotic

19. Choose the correct statement(s) referring to the plasma membrane:
A. It mainly consists of proteins and phospholipids
B. The lipids in the plasma membrane are arranged in two layers (bilayer structure)
C. The proteins in the plasma membrane are arranged in two layers (bilayer structure)
D. Has a solid mosaic structure due to the cholesterol which reduces its fluidity
E. The proteins in the membrane carry out various functions (enzymatic, transmembrane transport)

20. Phospholipids in the plasma membrane have the following type(s) of end:
A. Polarised, which contains phosphorus
B. Polarised, consisting of fatty acid chains
C. Unpolarised, which contains phosphorus
D. Unpolarised, consisting of fatty acid chains
E. Hydrophobic, consisting of fatty acid chains

21. Select the true statement(s) referring to plasma membrane proteins:
A. Transmembrane proteins may act as transporters of certain organic molecules
B. Can be classified into transmembrane and peripheral
C. Cholesterol is an example of transmembrane membrane
D. Haemoglobin is an example of peripheral protein
E. Transmembrane proteins may serve as channels for membrane transport

22. Select the *false* statement(s) referring the permeability of the cell membrane:

A. Oxygen molecules pass from pulmonary alveolae to red blood cells by osmosis
B. If one introduces red blood cells into a hypertonic solution, they will undergo the process of hemolysis
C. Plasma membrane, being semipermeable, facilitates the passage of small molecules
D. Active transport is achieved in the sense of the concentration gradient
E. In order to coordinate active transport, energy is obtained by disassembling a compound that contains high-energy-potential phosphate chains (adenosine triphosphate)

23. Choose the correct statement(s) referring to cross-plasma-membrane transport:
A. Diffusion is the movement of molecules from a high-concentration area to a low-concentration area (in the sense of the gradient concentration)
B. Diffusion is the movement of molecules from a low-concentration area to a high-concentration area (against the concentration gradient)
C. Osmosis is the diffusion of water molecules through a semipermeable membrane
D. Osmosis is the diffusion of water molecules from a low-concentration area of the solute to high-concentration area of the solute
E. The passing of oxygen from pulmonary alveolae to the capillaries is an example of osmosis

24. Choose the correct statement(s) from below:
A. The solute is a chemical substance dissolved in a fluid called solvent
B. The solvent is a chemical substance dissolved in a fluid called solute
C. A solution that has a higher salt concentration than the cytoplasm is called hypertonic solution
D. A solution that has a higher water concentration than the cytoplasm is called hypertonic solution
E. A solution that has a higher sodium chloride concentration than the cytoplasm is called a hypertonic solution

25. The plasma membrane is a semipermeable membrane because:
A. It allows the passing of water from a low-concentration-solute area to a high-concentration-solute area
B. It allows just certain molecules to pass (e. g., O_2, water, CO_2)
C. It contains proteins called histones
D. Together with the ribosomes, it is the location of protein synthesis
E. It does not facilitate the passage of large molecules to or from the cell

26. Which of the following are transport mechanisms across the cell membrane?
A. Diffusion, osmosis, glycolysis
B. Diffusion, facilitated diffusion, exocytosis
C. Osmosis – water diffusion, for example, water reabsorption in the renal tubules
D. Active transport – for example, reabsorption of salts in the renal tubules
E. Karyokinesis, transport through the channels, osmosis

27. Choose the correct statement(s) from below:
A. Phagocytosis represents the transportation of solid material by means of endocytosis
B. Pinocytosis represents the transportation of fluid drops by means of exocytosis
C. The release of neurotransmitters from the neuron presynaptic vesicles is achieved by exocytosis
D. The release of certain hormones from exocrine cells is achieved by exocytosis
E. Oxygen permeation of the erythrocyte membrane is achieved by diffusion

28. Choose the correct statement(s) referring to cytoplasm:
A. It is the place where certain cellular metabolic processes take place
B. It contains the cytoskeleton which consists of carbohydrate subunits
C. It contains specialised structures called organelles (endoplasmic reticulum, Golgi apparatus, etc)
D. It has a solid consistency, which is fundamental for a cell
E. Several cellular functions are carried out in the cytoplasmic organelles

29. The endoplasmic reticulum can be described as being:
A. A cytoplasmic organelle playing a specific role in protein synthesis (translation)
B. A functional structure located in the cytoplasm, playing a role in Ca^{2+} depositing
C. A complex of membranes which extend into the cytoplasm

D. The site of cellular respiration, containing the electron transport system
E. Of two types, smooth (site of lipid and membrane synthesis) and rough (with attached ribosomes)

30. Choose the correct statement(s) referring to the rough endoplasmic reticulum:
A. Is involved in protein synthesis (achieved by amino acid assembling in the attached ribosomes)
B. Has certain structures attached, called lysosomes, which host the chemical combination of amino acids
C. Is the site of lipid degradation
D. Is an organelle consisting in a complex of membranes, which extend into the cytoplasm and have ribosomes attached in some of their areas
E. Plays a role in protein synthesis through cellular respiration

31. The following statement(s) referring to lysosomes is/are true:
A. They contain enzymes which play a role in the cell digestion processes
B. They represent the site for the cell's sodium and calcium deposits
C. They contain enzymes which degrade the nutrient particles inside a cell and offers the final products to the cell
D. They represent a source of salts such as sodium chloride
E. They are vesicles which derive from the sacs of Golgi apparatus and contain enzymes for intracellular digestion

32. Which of the following structures *do not belong* to cell organelles?
A. Golgi apparatus, the endoplasmic reticulum
B. Kinetochore, chromosome
C. Mitochondria, ribosomes
D. Centrosome, lysosomes
E. Nucleolus, chromatin

33. Choose the correct statement(s) referring to the mitochondria:
A. These organelles are the site of carbohydrate and lipid breakdown resulting in energy production
B. Inside the mitochondria, cellular respiration is complete when oxygen combines with hydrogen and electrons and form water
C. These organelles are the site of glucose synthesis resulting in energy production
D. The energy produced by the mitochondria is stored as DNA (deoxyribonucleic acid)
E. They are cellular organelles involved in the cell's energy processes

34. Which of the following are elements of the cell cytoskeleton?
A. Intermediate filaments and microfilaments
B. Fibres, filaments and combined molecules
C. Macrofilaments and cilia
D. Macrotubules and flagella
E. Microtubules and microfilaments

35. Choose the true statement(s) referring to cilia and flagella:
A. The flagellum is a part of the spermatozoa ensuring its movement
B. The cilia are shorter structures than the flagella
C. The flagellum is a prolongation present in some of the respiratory tract cells
D. The cilia are present in the respiratory tract cells where they undulate synchronously
E. Unlike the flagella, the cilia are immobile and much longer

36. Choose the correct statement(s) regarding the nucleus:
A. The nucleus delimited by the membrane is present in eukaryote cells
B. The nucleus is present in all the cells of the human body, with the exception of red blood cells (erythrocytes)
C. The dense mass of the nucleus containing RNA (ribonucleic acid) is called nucleolus
D. Inside the cell's nucleus, RNA (ribonucleic acid) molecules fold around histone complexes in order to form chromatin
E. During the interphase period, when chromosomes cannot be distinguished from one another, the dispersed DNA mass and its associated proteins from the cell nucleus are called chromatin

37. Choose the correct statement(s) referring to the cell nucleus:

A. The shape and size of the nucleus differs from a cell type to another
B. The position of the nucleus inside the cell is a central one in all cell types
C. It is surrounded by a double membrane called nuclear membrane
D. Includes nucleoli, which contain ribonucleic acid (RNA)
E. The nucleoli are the site of lysosome synthesis

38. Choose the correct statement(s) referring to the nuclear membrane:
A. It is a porous membrane called cellular membrane
B. As it consists of two layers of phospholipids, it contains twice the quantity of phospholipids compared to the cellular membrane
C. It separates nuclear contents from the extracellular space
D. It is a double porous membrane
E. It controls the passage of substances between nucleus and cytoplasm

39. Choose the correct statement(s) referring to the cell's nuclear material:
A. It consists of deoxyribonucleic acid (DNA) and proteins
B. The non-spiral structure of chromosomes is called chromatin
C. The non-spiral structure of chromosomes is found in the metaphasic plate
D. The spiral form of chromosomes is called chromatin
E. The dispersed DNA (deoxyribonucleic acid) and histone mass forms chromatin

40. The following statement(s) is/are true regarding the cellular cycle:
A. In the gastrointestinal tract, cells divide often
B. The cell cycle has two important phases: the interphase and mitosis
C. The cell cycle is a repeating series of events including cellular growth and reproduction
D. The cell cycle has an interphase consisting of four phases
E. The contents of the nucleus is directly involved in cell reproduction

41. The interphase is a phase of the cell cycle in which:
A. The cell does not divide, but DNA (deoxyribonucleic acid) replication takes place
B. Chromosomes are aligned along the equatorial plate, also called a metaphase plate
C. Specific cell activity take place (e. g., secretion of substances in glandular cells)
D. There are three distinct phases: prophase, metaphase and telophase
E. Cell chromosomes are present as non-spiral chromatin

42. Choose the correct statement(s) referring to mitosis:
A. It is one of the two phases of a cell cycle, together with the interphase
B. It is one of the two phases of a cell cycle, together with the chromosome spiralisation
C. It is the phase of the cell cycle in which the cell's nuclear DNA is divided between the two daughter cells
D. Mitosis is followed by the S phase, a stage of interphase
E. It is the only period when the cell synthesises structural proteins

43. Choose the correct associations referring to the phases of the cell cycle:
A. Phase S – interphase – DNA (deoxyribonucleic acid) replication
B. Phase G_2 – mitosis – the cell grows
C. Phase G_1 – protein synthesis – non-spiral chromatin
D. Phase G_1 – enzyme synthesis – non-spiral chromatin
E. Phase S – mitosis – RNA (ribonucleic acid) replication

44. Chromatids, chromosomes and chromatin have the following common characteristics:
A. Are visible fibrillar structures
B. Contain the genetic information required for protein synthesis
C. Are associated with ATP (adenosine triphosphate) molecules, forming nucleosomes
D. Contain DNA (deoxyribonucleic acid) but do not contain RNA (ribonucleic acid)
E. Store genetic information

45. Choose the correct associations from the statements below:
A. Cleavage furrow – a groove in the kinetochore
B. Cytokinesis – takes place after the telophase
C. Mitosis and cytokinesis – make possible the growth of the body through sexual reproduction
D. Mitosis and cytokinesis – replacement of old and deteriorated cells by forming new cells
E. Cellular cleavage – strangulation of the cytoplasm by the cell membrane resulting in the formation of daughter cells

46. The following statement(s) is/are true regarding proteins:
A. They are inorganic compounds, used as enzymes in cellular chemical reactions
B. They are organic compounds, used as structural material in the cells of the body
C. They are present in the structure of microtubules and microfilaments
D. They are absent from the structure of the cytoskeleton, consisting of microtubules, microfilaments and intermediate filaments
E. They are specialised molecules which are exported by cells in order to be used in various extracellular activities

47. The following statement(s) is/are true referring to chromosomes:
A. They represent linear units where DNA is organized inside the cell nucleus
B. They contain functional segments called genes
C. Each chromosome consists of millions of units called nucleosomes
D. They develop by RNA condensation, the winding of RNA around histone complexes, forming nucleosomes, followed by the supra-spiralling of nucleosomes
E. Chromosome condensation results from the supra-spiralling of nucleosomes

48. Choose the correct answers referring to enzymes:
A. With a few exceptions, the name of the enzymes ends in the suffix „*-ase"*
B. Most enzymes are polynucleotides
C. At high temperatures, enzyme reactions are much faster
D. The thermal activation energy of an endergonic or exergonic reaction is produced by enzymes
E. The heat excess may trigger changes in an enzyme's protein structure and its alteration

49. The following statement(s) is/are true about adenosine triphosphate (ATP):
A. When it eliminates its terminal phosphate group, it releases an energy equivalent to 7.3 kcal/mol
B. When it decomposes in order to produce energy, it releases ribose and adenosine
C. It serves as an energy source during muscle contraction
D. It contains a single phosphate group with a high energy level, which is released under the action of ATP-ase
E. In the muscle fibre, it must be constantly regenerated from ADP and phosphate groups

50. The following statement(s) is/are true referring to the relation cell - energy:
A. Each chemical reaction of the body involves an energy exchange
B. Any chemical reaction which releases energy is called endergonic
C. The energy released during catabolic exergonic reactions is stored in ATP (adenosine triphosphate) molecules
D. A metabolic pathway is a sequence of physical changes that take place exclusively outside the cell
E. Triggering a chemical reaction requires an energy intake called activation energy

CHAPTER 2 ▸ The nervous tissue.

Organisation of the nervous tissue

1. Choose the correct statement(s) referring to the nervous system:
A. It coordinates complex processes which take place outside the body
B. It coordinates complex processes which take place inside the body
C. It ensures the integration of tissues and organs in the external environment
D. It responds to stimuli coming from the internal or external environment
E. It facilitates the senses (visual, auditory, taste, tactile, olfactory)

2. What could happen if the nervous system would cease to function?
A. The body's activity wouldn't change
B. Organ systems would function chaotically
C. The body's demands couldn't be met
D. Body temperature would be regulated by independent systems
E. Cognitive processes and emotions would cease

3. Referring to the central nervous system (CNS), the following statements are true:
A. It consists of the encephalon (located in the cranial cavity) and the spinal cord (located in the spinal canal)
B. It consists of 12 pairs of cranial nerves which connect the receptors and effectors with the encephalon
C. It is the body's central control centre
D. Certain CNS components receive the incoming information and release the appropriate reactions
E. It consists of 31 pairs of spinal nerves which connect the encephalon to the spinal cord

4. Choose the correct statement(s) referring to the peripheral nervous system (PNS):
A. It consists mainly of the axons and dendrites of sensory and motor neurons
B. Neuronal cellular bodies are located in the central nervous system or close to it (lymph nodes)
C. It consists of the spinal cord and 31 pairs of spinal nerves
D. It consists exclusively of axons and dendrites which form the mixed nerves
E. The PNS informs the CNS about the stimuli coming from the external environment

5. Select the components of the peripheral nervous system:
A. The 21 pairs of spinal nerves apparently originating in the base of the encephalon
B. The 21 pairs of cranial nerves which include 3 pairs of sensory nerves (I, II, VIII)
C. The 31 pairs of spinal nerves which apparently originate in the spinal cord
D. The 12 pairs of cranial nerves which include 5 pairs of motor nerves (III, IV, VI, XI, XII)
E. The spinal nerves which contain dorsal (efferent, motor) and ventral (afferent, sensory) roots

6. The following statement(s) is/are true about the vegetative or autonomic nervous system:
A. It regulates the activity of skeletal muscles and exocrine glands
B. It regulates the activity of involuntary muscles and of glands (endocrine and exocrine)
C. It regulates the activity of skeletal muscles and of salivary glands
D. It contains two types of motor nerves: sympathetic and parasympathetic
E. Parasympathetic nerves ensure the body's relaxation capacity

7. Choose the correct statement(s) referring to the cells of the nervous system:
A. They are represented by two types of cells: neurons and glial cells
B. Glial cells are supporting cells
C. The number of glial cells is ten times less than that of neurons
D. Neurons receive and transmit biochemical signals
E. Neurons can be differentiated from one another due to their cellular organelles

8. Neuroglia have the following functions:
A. Astrocytes – contribute to the formation of the blood-brain barrier

B. Microglia – form myelin sheaths by enveloping the projections of other cells in the nervous system
C. Schwann cells – form the myelin sheath enveloping the neurons located outside the central nervous system
D. Astrocytes help isolate the damaged nervous tissue
E. Oligodendrocytes – form myelin sheaths enveloping the projections of the central nervous system neurons

9. According to their structure, neurons can be:
A. Multipolar, when they have multiple axons and a single dendrite
B. Multipolar, when they have multiple dendrites and a single axon
C. Pseudounipolar, when they have a single projection which divides to form two dendrites
D. Pseudounipolar, when they have a single projection which divides to form a dendrite and an axon
E. Bipolar, when they nave a single axon and a single dendrite

10. According to their function, neurons can be classified into:
A. Afferent neurons, efferent neurons and association neurons
B. Multipolar neurons, bipolar neurons and pseudounipolar neurons
C. Sensory neurons, motor neurons and interneurons
D. Sensory neurons (efferent) and motor neurons (association neurons)
E. Neurons which send information from receptors to the central nervous system, neurons which send messages from the central nervous system to the muscles, heart and lymph nodes, and interneurons also called association neurons

11. Choose the true statement(s) referring to the structure of the neuron:
A. The cell body represents the major part of the cell's total size
B. The cell body represents a small part of the cell's total size
C. Dendrites are specialised in receiving nervous impulses and sending them from the cell body
D. The surface of dendrites is covered with thousands of spines which help dendrites connect to other neurons
E. The neuron's cell body contains the nucleus, mitochondria, Golgi apparatus, lysosomes, Nissl bodies

12. Choose the true statement(s) referring to neurons and their projections:
A. The length of the axon is microscopic and its diameter may exceed one meter
B. Axons originating in the lower part of the spinal cord and extend to the foot may reach 1.2 meters
C. Often, the axons of a single neuron join together and form nerves
D. At their distal end, axons have axon terminals with swollen ends called synaptic boutons
E. Dendrites are specialised in receiving nerve impulses and relaying them to the cell body

13. Choose the true statement(s) referring to the neuron's myelin sheath:
A. It is a stratified membrane produced by two types of cells – oligodendrocytes and Schwann cells
B. In the peripheral nervous system, oligodendrocytes have projections that envelop the neuronal axons
C. Schwann cells envelop the neuronal body
D. Myelin is a major component of the oligodendrocyte membrane and of Schwann cells
E. Myelin isolates electrochemical reactions which transmit nervous impulses along axons

14. The following statement(s) is/are true referring to nerves and lymph nodes:
A. The nerve consists of several axon and/or dendrite bundles
B. The nerve is enveloped on the outside by the perinerve, a fibrous connective tissue which strengthens the bundles
C. In the structure of a nerve, each nerve bundle is surrounded by a sheath called perinerve
D. Lymph nodes are structures which contain the cell bodies of neurons
E. There are several lymph nodes located inside the spinal cord

15. The following statement(s) is/are true referring to the physiology of nerves:
A. Reception means getting information from the surrounding environment
B. The activity of relaying information refers to information being transmitted to the central nervous system by motor neurons
C. The activity of relaying information refers to information being transmitted to the central nervous system by sensory neurons
D. Integration is subsequent to transmission and refers to the activity during which the proper response is being determined
E. Motor neurons transmit the response to the effectors which will react contrary to the stimulus

16. In a reflex arc:
A. The role of the receptor is to detect internal or external alterations
B. Components are represented in the following order by receptors, interneurons, sensory neurons, motor neurons, effectors
C. Components are represented in the following order by receptors, sensory neurons, interneurons, motor neurons, effectors (muscle or lymph node)
D. The role of the effector is to respond to the stimulus received from the motor neuron and to produce a reflex action
E. The receptor serves as a processing centre

17. Which of the following statements referring to the reflex act is/are true?
A. It represents the anatomic base of certain neural circuits
B. It can be automatic and unconscious when it involves the encephalon or a mental activity
C. It can be automatic and unconscious without involving the encephalon or a mental activity
D. A reflex occurs when a sensory neuron receives a stimulus
E. A typical example of a reflex act is the patellar reflex

18. The following statement(s) is/are true referring to a resting neuron:
A. It is polarised because the internal and external surface of its membrane have opposite electrical charges
B. It is not polarised, as there is no potential difference between the internal and external surface of its membrane
C. There are no electric charges on the internal and external surface of its membrane as these are present only in the cytoplasm and the nucleus
D. Its cytoplasm has a negative electric charge
E. The external surface of its membrane has a positive electric charge

19. Choose the true statement(s) referring to the nervous impulse:
A. It originates in an electrochemical event triggered by the altered ion distribution in the glial cell
B. It originates in an electrochemical event triggered by the altered ion distribution in the nerve cell
C. It is transmitted by the resting neuron
D. It is also called action potential
E. When it is generated, a stimulus (electric, mechanical, chemical) changes the resting potential by opening sodium channels and allowing the passage of sodium ions into the nerve cell

20. A synapse is the junction between:
A. A neuron and an effector (muscle)
B. A neuron and a lymph node
C. Two muscle cells
D. Two neurons (a presynaptic one and a postsynaptic one)
E. Two oligodendrocytes

21. The synapse between a neuron and a muscle cell is called:
A. Motor plate
B. Desmosome
C. „Gap" junction
D. Neuromuscular synapse
E. Neuromuscular junction

22. The following statement(s) is/are true referring to neurotransmitters:
A. They are chemical substances belonging to different classes of compounds (catecholamines, amino acids etc.)
B. They are released from the terminal buttons of the presynaptic neuron axon and cross the synaptic gap
C. They are released from the synaptic cleft (gap) towards the presynaptic membrane
D. They are released from the glial cell adjoining the neuron
E. Their connection to the postsynaptic membrane receptors generates an action potential in the postsynaptic neuron

23. Acetylcholine is released by:
A. The neurons which innervate skeletal muscles at the point of their synapse with another neuron

B. The neurons which innervate skeletal muscles at the point of the neuromuscular junction
C. Certain neurons from the vegetative component of the peripheral nervous system
D. All the motor or efferent neurons in the encephalon
E. Some of the neurons in the encephalon

24. The following statement(s) is/are true about serotonin:
A. It is the single neurotransmitter in the parasympathetic nervous system
B. It is not involved in sleep regulation
C. It is a neurotransmitter present both in the encephalon and in the spinal cord
D. It can be involved in certain mental functions or in the circadian rhythm
E. It is the neurotransmitter specific to the motor plate

25. The activity of certain neurons can be inhibited by:
A. Gamma aminobutyric acid – only in the encephalon
B. Gamma aminobutyric acid – in the encephalon
C. Certain neurotransmitters which keep sodium channels closed
D. Glycine – mainly in the encephalon
E. Glycine – mainly in the spinal cord

26. Which of the following neurotransmitters belong to the class of catecholamines?
A. Acetylcholine, adrenaline and epinephrine
B. Adrenaline and noradrenaline
C. Dopamine, glycine and glutamate
D. Noradrenaline and dopamine
E. Serotonin and cholinesterase

27. Excitatory postsynaptic potentials are induced by the neurotransmitters which:
A. Excite the postsynaptic neuron
B. Induce postsynaptic-neuron-membrane depolarisation
C. Maintain the sodium channels closed
D. Open sodium channels, allowing sodium ions to penetrate the cell
E. Inhibit the occurrence of nerve impulses in the postsynaptic neuron

28. Excitatory postsynaptic potentials (EPSP) are induced by neurotransmitters which:
A. Inhibit the occurrence of nervous impulses in the postsynaptic neuron
B. Stimulate the occurrence of nervous impulses in the postsynaptic neuron
C. Keep sodium channels closed
D. Open sodium channels
E. Have no effect on ion sodium channels in the neural membrane

29. The following statement(s) is/are true referring to the spinal cord:
A. It is 45 cm long and it is located in the central canal
B. It lies in the bony canal formed by the vertebrae
C. It originates in the large opening (*foramen magnum)* of the occipital bone, extending downwards through the bony canal formed by the vertebrae
D. It ends near the intervertebral disc which separates the first two sacral vertebrae
E. The spinal cord's external surface contains a white substance mainly consisting of neuronal bodies and unmyelinated neurons

30. A cross section of the spinal cord reveals:
A. The nervous tissue enveloped by three meningeal layers
B. The central canal also called ependymar canal
C. A grey matter on the outside, consisting of horns (anterior, lateral and posterior)
D. A grey matter on the inside consisting of horns
E. A white mater on the outside consisting of myelinated nerve fibres

31. Which of the following membranes form the meninges?
A. The dura mater, fibrous, resistant connective tissue
B. The arachnoid, separated from the dura mater by the subarachnoid space
C. The arachnoid, network-like thin layer
D. The pia mater, richly vascularised external layer
E. The pia mater, richly-vascularised very thin layer

32. The following statement(s) is/are true referring to the cerebrospinal fluid:
A. Cannot be found outside the dura mater
B. Can be found in the space between the dura mater and the arachnoid
C. It is collected by spinal tap (lumbar puncture) whenever a bacterial infection is suspected
D. Whenever a disorder of the nervous system is suspected, a sample can be collected by spinal tap (lumbar puncture) for lab analysis
E. Its function is to ensure the necessary nutrients required by the nerve cells of the central nervous system

33. Comparing spinal nerves and cranial nerves, one can state that:
A. They differ in number, there being 12 pairs of cranial nerves and 33 – 34 pairs of spinal nerves
B. Their apparent origin is the base of the encephalon (cranial nerves) and the spinal cord (spinal nerves)
C. Spinal nerves and some of the cranial nerves contain both sensory fibres and motor fibres
D. Some cranial nerves contain fibres belonging to the vegetative nervous system (the vagus nerve)
E. The spinal nerves innervate several structures such as the skin, skeletal muscles, joints, blood vessels, mucosae, sweat glands (with the exception of the head and the neck)

34. Choose the true statement(s) referring to the specific structures which make up the cerebral trunk:
A. The bulb hosts the centres which regulate cardiac activity and blood pressure
B. The mesencephalon closes the cough reflex
C. The bridge functions as a relay between the two cerebellar hemispheres
D. The mesencephalon controls the reflex movements of the head and trunk as response to auditory stimuli
E. The medulla oblongata sends signals to the cerebellum and the thalamus, but does not involve signals from the spinal cord

35. The following statement(s) is/are true about the cranial nerves:
A. They belong to the peripheral nervous system, together with the spinal nerves
B. They belong to the central nervous system, together with the cerebral trunk
C. Some of them originate in the cerebellar hemispheres
D. They are designated by numbers (I – XII) and a different name for each
E. Their apparent origin is described – the place where the nerve becomes visible

36. Which of the following statements referring to the cranial nerves are *false*?
A. Nerves I, II and VII are sensory nerves
B. Nerves I, II and VIII are sensory nerves
C. nerves III, IV, VI, VII and XI are motor nerves
D. Nerves III, IV, VI, XI and XII are motor nerves
E. Nerves I, II and VII are mixed nerves

37. Choose the correct statement(s) referring to the cerebral hemispheres:
A. They represent a small part of the encephalon and contain the motor and sensory nerve centres
B. They represent most of the encephalon and control complex mental functions
C. The insular lobe or insula is a deep area of the cerebral hemispheres
D. Each hemisphere contains the frontal, parietal, temporal and occipital lobe
E. They represent the centre of reasoning and memory and greatly determine the intelligence of an individual

38. Which of the following statements describe(s) correctly structural aspects of the cerebral hemispheres?
A. They are joined by a bridge called corpus callosum, made of neuronal bodies and glial cells
B. They are joined by a bridge called corpus callosum, made of nerve fibres

C. They control complex mental functions (reasoning, learning, creativity)
D. The frontal lobe lies anterior to each cerebral hemisphere
E. Their surface is crossed by several grooves and gyri

39. Choose the correct statement(s) referring to the cerebral hemispheres:
A. They contain neurons which interpret the nervous impulses coming from sense organs
B. They contain neurons which initiate voluntary responses to stimuli
C. Certain areas of the parietal lobe are associated with reasoning and learning
D. Certain areas of the parietal lobes are responsible for understanding speech and expressing ideas
E. Visual sensations are not interpreted in the occipital lobes

40. The following statement(s) about the cerebral hemisphere ventricles is/are correct:
A. They are interconnected cavities, containing cerebral tissue
B. They are cavities containing a fluid which serves as nutrient for nerve cells
C. They contain cerebrospinal fluid, which is also located in the ependymal canal of the spinal cord
D. Two of them (the lateral ventricles) lie inside the cerebral hemispheres
E. The third ventricle lies between the cerebral trunk and the cerebellum

41. The following statement(s) referring to the lobes of the cerebral hemispheres is/are true:
A. The frontal lobe is anterior to the central sulcus
B. The parietal lobe is posterior to the frontal lobe and separated from it by the central sulcus
C. The temporal lobe is posterior to the frontal lobe and separated from it by the lateral sulcus
D. Below the frontal lobe and separated from it by the lateral sulcus, lies the temporal lobe
E. Posterior to each hemisphere, lies the occipital lobe

42. Choose the correct associations between the components of the encephalon and their functions:
A. The basal nuclei – control muscle tone
B. The limbic system – centres if pleasure and of punishment
C. The hypothalamus – enzyme production which control the hypophysis
D. The cerebellum – coordinates the activity of endocrine glands
E. The reticular formation (bulb, pons and mesencephalon) – stimulation of cognitive processes

43. Choose the correct statement(s) referring to the sensory areas of the cerebral hemispheres:
A. They are responsible for sensations, feelings and emotions
B. The area responsible for the sense of smell is located deep inside the cerebral hemispheres
C. The occipital lobe contains areas for the sense of sight (unilateral and ipsilateral vision)
D. The sensory areas for hand, lips and tongue are located anterior to the central sulcus
E. The areas for the sense of hearing are located in the temporal lobe, which is also responsible for the auditory and visual memory

44. The following is/are true about the main motor area:
A. It is situated in the frontal lobe
B. Contains large pyramidal neurons which generate impulses transmitted along the corticospinal tract
C. The frontal lobe, in Broca's area, is responsible for the motor activity connected to speech and language processing
D. Broca's area is not involved in the motor activity connected to language processing
E. Due to the crossing over of the corticospinal tracts, the impulses received from the left hemisphere control the motor activity of the body's right side

45. The following statement(s) is/are true referring to the vegetative or autonomic nervous system:
A. It regulates the activity of skeletal muscles and of exocrine glands
B. It acts involuntarily without conscious control
C. It regulates the activity of skeletal muscles of the trunk and limbs
D. It coordinates the homeostatic functions of certain viscera, such as the heart
E. Parasympathetic nerves relax the body after a situation of stress or danger

46. The sympathetic component of the autonomic (vegetative) nervous system:

A. Activate the body for fight or flight („fight or flight" reaction)
B. Its neurotransmitter is represented by noradrenalin released from postganglionic fibres
C. Releases acetylcholine from the postganglionic fibres
D. Prepares the body for emergency situations
E. Generates effects opposed to those triggered by adrenalin

47. The parasympathetic component of the autonomic (vegetative) nervous system:
A. Activates the body for emergency situations
B. Induces the relaxation of the body after a situation of stress or danger
C. Contains cholinergic postganglionic fibres (which use acetylcholine as neurotransmitter)
D. Its preganglionic neurons are located at cranio-sacral level (in the cerebral trunk, respectively in the sacral spinal cord)
E. Has an effect that extends to the entire body

48. The following processes are effects of the sympathetic component of the autonomic (vegetative) nervous system:
A. Acceleration of the heart rate
B. Slowing down the heart rate
C. Relaxation of the bronchi
D. Decreased stimulation of salivation
E. Constriction of the pupil

49. The following processes are effects of the parasympathetic component of the autonomic (vegetative) nervous system:
A. Slowing down of the heart rate and dilatation of the arteries
B. Constriction of the pupil
C. Stimulation of the digestion
D. Inhibition of the erection of sex organs
E. Contraction of the urinary bladder

50. Choose the correct statement(s) referring to cerebral hemispheres:
A. They contain more than 10 billion neurons
B. They represent the largest part of the encephalon
C. The shallow groove of the hemispheres is called fissure
D. Each hemisphere is divided into five lobes
E. Each hemisphere is divided into four lobes

CHAPTER 3 ▸ Sense organs

1. Choose the correct statement(s) referring to senses:
A. Senses include vision, hearing and balance, excluding the sense of touch which belongs to the integumentary system
B. They include the sense of touch, balance and vision
C. Different sense organs have the same type of receptors
D. Sense organs have highly specialised receptors
E. They are tightly associated both functionally and structurally with the nervous system

2. In short, the following associations between sense organs and their anatomical location are true:
A. The olfactory mucosa – inferior in the nasal cavity
B. The olfactory mucosa – superior in the nasal cavity
C. Taste buds – the dorsal part of the tongue
D. The auditory apparatus – middle ear
E. The vestibular system – internal ear

3. In short, the following associations between sense organs and the nature of the stimulus are *false*:
A. Taste buds – chemical substances (solutions)
B. The auditory apparatus – mechanical stimuli (luminous energy)
C. The vestibular system – mechanical stimuli (deflection)
D. The eye – light (luminous stimuli)
E. The olfactory mucosa – chemical stimuli (vibrations)

4. The skin contains the following receptors of the sense of touch and related senses:
A. Free nerve endings (for pain)
B. Merkel discs (for pain)
C. Meissner corpuscles (for light pressures)
D. Meissner corpuscles (for strong vibrations)
E. Pacinian corpuscles (for strong pressures and vibrations)

5. Different stimuli are received as follows:
A. Strong vibrations – by the free nerve endings in the skin
B. Molecules of odorous substances – by the cilia of the olfactory cells
C. Pain – by the free nerve endings in the skin
D. Pain – by the Pacinian corpuscles in muscles and joints
E. Light stimuli – by the receptor cells in the retina

6. Choose the correct statement(s) from below:
A. The sense of smell is also called olfactory
B. The sense of balance is associated with canals and receptors located in the middle ear
C. The sense of taste is not associated with canals and receptors located in the cochlea
D. The intensity of sound waves is usually expressed in cycles/second or Hertz
E. The receptors which detect stimuli are specialised structures

7. It is true that:
A. The temporal lobe contains areas which control visual and auditory memory
B. The occipital lobe does not interpret visual sensations
C. The occipital lobe contains areas which control contralateral vision
D. The area responsible for the sense of smell is located superficially in the cerebral hemispheres
E. The cerebral hemispheres contain neurons which interpret the impulses received from the sense organs

8. As a sense organ, the eye:
A. Contains receptors which detect light stimuli (photoreceptors)
B. Reflects the light from the surrounding environment and forms an image in the retinal photoreceptors

C. Receives light from the surrounding environment and forms an image in the retinal nerve receptors
D. Forms an image in the photoreceptors of the retinal pigment epithelium (layer)
E. Sends the image to the brain under the form of nerve impulses

9. The following statement(s) is/are true about the eye as the organ of vision:
A. It is stimulated by the light coming from the surrounding environment
B. Its receptors belong to the class of chemoreceptors
C. Its receptors belong to the class of photoreceptors
D. The nervous impulses generated by light stimuli are interpreted in the brain
E. The retina (a structure of the eye) detects light in its external layer, the retinal pigment epithelium

10. Select the correct statement(s) referring to the eyeball:
A. It is an approximately spheroidal structure with an anterior part protruding outside the sphere
B. It has a posterior part protruding outside the sphere
C. It has a wall consisting of three layers (coats)
D. Its longitudinal diameter is longer than the transversal one
E. Its length is greater than its width

11. The accessory structures of the eye are:
A. Refractory structures represented by the crystalline, cornea, aqueous humour and vitreous humour
B. Eyebrows and lashes which protect the pupil from foreign bodies
C. Lacrimal glands whose secretion washes the eyeball and maintains it wet
D. Eyelids which protect the posterior part of the eye
E. The conjunctiva which lines the internal part of the eyelids

12. The following statement(s) is/are true referring to the compartments of the eye:
A. Both the anterior and the posterior compartment are subdivided into two regions
B. The anterior compartment has two regions: the aqueous chamber and the vitreous chamber
C. The anterior compartment has two regions: the anterior chamber and the posterior chamber
D. The anterior chamber of the anterior compartment contains the aqueous humour
E. The posterior chamber of the anterior compartment contains a gelatinous substance

13. The following statements are true referring to the external wall of the eyeball:
A. It is richly vascularized
B. It contains the visual receptors
C. It is resistant and fibrous
D. It contains the cornea and sclera
E. It contains the choroid and the ciliary bodies

14. Choose the true statements referring to the iris:
A. It is a component of the eyeball's middle layer
B. It controls the quantity of light that passes through the pupil
C. It contains pigments which are responsible for image formation
D. It consists of two layers of striated muscles (a constrictive muscle and a dilator muscle)
E. It belongs to the eyeball's middle layer together with the choroid and the ciliary body

15. Choose the true statements referring to the choroid:
A. It belongs to the eyeball's middle layer together with the iris and ciliary body
B. It contains the blood vessels of the eye structures
C. It does not belong to the eyeball's external layer
D. It contains the ciliary muscle and the crystalline's suspensory ligament
E. It is joined to the iris in the middle of the latter

16. Choose the true statement(s) referring to the iris:
A. It contains pigments which define eye colour
B. It contains a peripheral aperture called pupil (optic disc)

C. It controls the amount of light passing through the pupil
D. It consists of two layers of smooth muscle
E. The dilator muscle of the iris contracts the pupil

17. Choose the *false* statement(s) referring to the aqueous humour:
A. It is a fluid which fills exclusively the anterior chamber of the eyeball
B. It is a gelatinous substance situated in the posterior chamber of the eyeball
C. It maintains the retina attached to the choroid
D. It maintains intraocular pressure
E. It does not detect and it does not absorb light

18. The following statement(s) is/are true about the crystalline:
A. It belongs to the refractory structures of the eye
B. It consists of a concentric protein fibrous material
C. It is transparent and elastic
D. It focuses light onto the choroid
E. It is the main structure responsible for image focalising

19. The following statement(s) is/are true about the retina:
A. It is a part of the eye's internal layer
B. It consists of two layers, external – pigmented, and internal – consisting of nerve tissue
C. Its internal layer consists of three layers of unipolar neurons
D. It plays a role in accommodation
E. It detects light and forms the images that will be sent to the encephalon

20. The following are structural elements of the retina:
A. Bipolar neurons which receive nerve impulses
B. Multipolar neurons which form the third layer of the retina proper
C. Cone cells, about 6 – 7 million
D. Rod cells, which do not contain rhodopsin
E. Bipolar and multipolar receptor neurons

21. Choose the correct statement(s) referring to the receptor cells of the retina:
A. They are located in the retina proper, in the immediate vicinity of the cornea
B. They are receptor neurons
C. Rod cells play a role in detecting the contour of objects
D. Cone cells are responsible for twilight and night vision
E. Cone cells are concentrated in the central fovea

22. The cone cells of the retina:
A. Are receptor neurons
B. Are located predominantly at the periphery of the retina
C. Are concentrated in the central fovea
D. Are responsible for day vision and for perceiving details and colours
E. Is responsible for twilight vision

23. A light ray follows the following trajectory in the eye:
A. Conjunctiva – cornea – pupil – vitreous humour – crystalline – focusing in the central fovea
B. Pupil – aqueous humour – cornea – crystalline – vitreous humour – focusing in the optic disc
C. Cornea – crystalline – iris – aqueous humour – focusing on the retina
D. Cornea – aqueous humour – pupil – crystalline – vitreous humour – focusing on the retina
E. Cornea – aqueous humour – crystalline – pupil – vitreous humour – focusing in the central fovea

24. Nerve impulses in the retina are carried:
A. Initially, through the optic tract, then through the optic nerve, to the cerebral visual cortex
B. Initially, through the optic nerve, then through the optic tract, to the cerebral visual cortex

C. Initially, through the optic chiasm and eventually through the optic tract to the thalamus
D. At the level of the cerebellar visual cortex
E. To the cerebral visual cortex, where they are interpreted

25. Choose the correct statement(s) referring to taste:
A. It is also called gustation
B. It requires the contact between receptor connective cells and the molecules of substances
C. Its receptors are situated in the taste buds
D. It is involved in the stimulation of proprioceptors of the pharynx
E. The receptors of the taste buds detect chemical substances after they have been dissolved

26. The taste buds:
A. Are located at the basis of the taste papillae
B. Contain receptor gustatory cells and supporting cells
C. Have exclusively supporting cells and receptor nerve endings
D. Have sensory nerve fibres which send impulses to the encephalon
E. Have sensory, sympathetic and parasympathetic, nerve fibres

27. Choose the correct statement(s) referring to primary tastes:
A. They are four in number: bittersweet, sourness, bitterness, saltiness
B. They include the tastes of sweet and bitter
C. The taste umami (savouriness) is connected to glutamate
D. The taste bitter is perceived mainly at the back of the tongue
E. The taste sour is mainly perceived by the receptors near the pharynx

28. The receptors for the perception of the 5 primary tastes are located as follows:
A. For umami – near the larynx
B. For umami – near the pharynx
C. For sweetness – mainly at the tip of the tongue
D. For sourness – at the back of the tongue
E. For bitterness – at the back of the tongue

29. The primary tastes include:
A. Sour, bitter, spicy
B. Sour, bitter, umami
C. Sour, bitter, sweet
D. Umami, salty, spicy
E. Sweet, salty, umami

30. Which of the following statements represent common characteristics of the olfactory and taste analysers:
A. They are senses which require a contact between specific receptors and the molecules of the substances which are to be detected
B. They contribute to the absorption of protein digestion products
C. Their receptors are unspecific chemoreceptors belonging to proprioceptors
D. Their receptors are specific chemoreceptors belonging to exteroceptors
E. Their receptors are located in the central nervous system

31. Choose the correct statement(s) referring to the sense of smell:
A. It has specialised receptors (olfactory cells)
B. It is a sense based on chemical insoluble and non-volatile substances
C. It requires the contact between receptors and the molecules of the substances which are to be detected
D. It is also called olfactory sense
E. It is involved in the absorption of water in the gastrointestinal mucosa

32. Choose the correct statement(s) about the olfactory receptors:
A. They are specialised olfactory cells
B. They are represented by multipolar ciliary cells in the olfactory mucosa

C. They are chemoreceptors which suffer from olfactory fatigue
D. They are located in the respiratory mucosa in the upper part of the oral cavity
E. They are cells having olfactory cilia and a single nucleus

33. Choose the correct associations:
A. Free nerve endings in the skin – exteroceptors - pain
B. Pacinian corpuscles – skin – strong pressure and vibrations
C. Meissner corpuscles – light pressure – strong vibrations
D. Hearing – skin receptors – muscle and joint receptors
E. Merkel discs – skin – tactile stimuli

34. Choose the correct statement(s) referring to the sense of touch:
A. It is related to the senses of pain and pressure, but not to vibration
B. It is related to the senses of pressure, pain and vibration
C. Its receptors are represented by the free nerve endings in the skin
D. Together with its related senses, it uses receptors located in muscles and joints
E. Tactile receptors are represented only by the pain receptors from the viscera

35. The following statement(s) is/are true about pressure and vibration (related to the sense of touch):
A. Light pressures and vibrations on the skin are not detected by Meissner corpuscles
B. Strong vibrations on the skin are detected by Meissner corpuscles
C. Strong pressure to the skin is detected by the Pacinian corpuscles
D. Pain is perceived by all tactile receptors, with the exception of free nerve endings
E. The impulses gathered by the pressure and vibration receptors are sent to the encephalon, where they are interpreted

36. The following are components of the external ear:
A. The external auditory orifice representing the entrance to the external auditory canal
B. The auricle
C. The external auditory canal which transmits sound vibrations
D. The malleus, incus and stapes which transmit vibrations to the tympanic membrane
E. The Eustachian tube which connects the pharynx to the middle ear

37. The following statement(s) is/are true referring to the Eustachian tube:
A. It is located between the middle ear and the inner ear
B. It extends from the external ear to the cochlea
C. It connects the cochlea to the semicircular canals
D. It extends between the pharynx and the middle ear
E. It helps maintain equal pressure on both sides of the tympanum

38. Choose the *wrong* associations from below:
A. Malleus – hammer – in contact with the tympanum
B. Stapes – incus – in contact with the round window
C. Stirrup – stapes – in contact with the oval window
D. Cochlea – cubic shape – middle ear - perilymph
E. External auditory canal – external ear – generation of sound vibration

39. Select the true statement(s) referring to the external ear:
A. It consists of the auricle and the inner auditory canal
B. It is delimited from the middle ear by the tympanic membrane
C. It communicates with the middle ear through the oval window
D. It consists of the auricle and the external auditory canal
E. It communicates with the pharynx through the Eustachian tube

40. Choose the true statement(s) referring to the Eustachian tube:
A. It connects the middle ear to the anterior wall of the laryngopharynx
B. It is a duct that ensures an equal pressure on both sides of the tympanum

C. It connects the middle ear to the lateral wall of the nasopharynx
D. It is accessible to microorganisms from the nasopharynx
E. Each tube opens in the part of the pharynx immediately inferior to the soft palate

41. The following statements are true referring to the bony labyrinth:
A. It contains perilymph which surrounds the membranous labyrinth
B. It contains endolymph, similar to the interstitial fluid
C. It is located in the inner ear and houses the cochlea, the vestibule and the semicircular canals
D. It is located in the middle ear and houses the cochlea, the vestibule and the semicircular canals
E. It contains the membranous labyrinth

42. Choose the correct statement(s) referring to the membranous semicircular canals:
A. They are a part of the membranous labyrinth
B. Each is connected to the utricle, located superior to the saccule
C. Each is connected to the saccule, located inferior to the utricle
D. The utricle and semicircular canals are associated to the sense of balance
E. At the junction with the utricle, each canal has a dilated part called ampulla

43. Sound waves are characterised by:
A. Intensity, which varies according to the amplitude of the sound wave
B. Timbre (quality) of sound, which depends on tone harmonic
C. Refraction, which is the return of the sound wave to its original environment
D. Frequency, consisting of the number of air vibrations per unit of time
E. Decibels, which determine the timbre or the quality of sound

44. Choose the correct statement(s) from below:
A. Both the intensity and the frequency of sound are expressed in decibels
B. The intensity of sound is expressed in decibels
C. Sound waves are mechanical waves
D. Sound waves do not propagate through air
E. Sound waves, through their energy, produce the vibration of the tympanum

45. The following structures are involved in the hearing process:
A. The tympanum, which vibrates under the action of sound waves coming through the external auditory canal
B. The oval window, which is in contact with the stapes
C. Corti's organ in the middle ear
D. The tectorial membrane which mobilises the connective receptor cells in the middle ear
E. The temporal lobes in the cerebral hemispheres where sounds are interpreted

46. Choose the correct statement(s) referring to the sense of balance:
A. It derives from the activity of the middle ear, just like the sense of hearing
B. It derives from the activity of the inner ear, which contains a series of canals crossing the temporal bone
C. In the cochlea, there are structures which detect the dynamic and the static balance
D. In the utricle, saccule and the semicircular canals, there are structures which detect dynamic and static balance
E. The vestibular branch of nerve VIII sends to the encephalon the impulses from the ampulla and the macula

47. The following structures are associated with the sense of balance:
A. The semicircular canals which belong to the membranous labyrinth and contain endolymph, with the same composition as plasma
B. The utricle and saccule which contain endolymph, similar to the interstitial fluid
C. The ampulla, the dilated portion of each semicircular canal near the junction with the saccule
D. Ciliary sensory cells in the semicircular canal ampullae
E. Ciliary sensory cells and the membrane with small calcium carbonate fragments (otoliths) in the maculae of the utricle and saccule

48. Choose the true statement(s) referring to the receptors of the vestibular apparatus:

A. They are mechanoreceptors situated in the inner ear
B. They are exteroceptors situated in the middle ear
C. They are located in Corti's organ
D. They are groups of ciliary sensory cells located in the ampullae of the semicircular (membranous) canals (ducts)
E. They are located in small structures (maculae) in the utricle and saccule

49. The following statement(s) is/are true referring to the fragments of calcium carbonate:
A. They are also called uroliths and have an organic structure
B. They are also called otoliths and have an inorganic structure
C. They belong to the membrane which covers the ciliary cells in the utricular and saccular maculae
D. They are a part of the tectorial membrane
E. Otoliths change their position and influence the ciliary cells of the macula due to the pressure caused by changing the position of the head

50. Choose the correct statement(s) which characterise static and dynamic balance:
A. The semicircular canals, through the ampullae, perceive the changes in the position of the head which help maintaining the body's dynamic balance
B. The utricle and saccule, through their macular receptors, are responsible for the nerve impulses which contribute to maintaining posture
C. Nervous impulses responsible for maintaining static and dynamic balance are transmitted through the cochlear nerve (pair VII) to the encephalon
D. The term „posture" characterises the body's dynamic balance
E. The receptors in the semicircular canals (ducts) transmit to the encephalon along the vestibular branch of the vestibulocochlear nerve (VIII)

CHAPTER 4 ▸ The bone tissue

1. Choose the correct statement(s) referring to the skeletal system:
A. It includes all the organs in the body (solid and resistant organs)
B. It includes all the bones of the body and their connecting joints
C. It consists of organs which are not supplied by their own nerves and vessels
D. It is a system of organs which support locomotion and movement
E. It contains bones which consist wholly in semi-rigid connective tissue

2. Choose the correct statement(s) referring to bones and joints:
A. The skeleton is made up of bones connected to each other by joints
B. Joints can be mobile (synarthroses), semi-mobile (amphiarthroses) and fixed joints (diarthroses)
C. Diaphyses are the extremities of a bone and the epiphysis is the shaft or central part of a bone
D. Long bones consist of epiphysis and diaphysis
E. The skeleton supports the body and facilitates locomotion

3. Choose the correct statement(s) referring to the location of bones:
A. The axial skeleton includes the humerus, the femur and the patella
B. The axial skeleton consists of the thoracic cavity (rib cage), the spinal column and the bones of the head
C. The skeleton of the limbs includes the corresponding girdles which connect the limb to the axial skeleton
D. The pelvic girdle connects the upper limb to the trunk
E. The pectoral girdle connects the upper limb to the trunk

4. According to their shape, bones can be:
A. Long bones, such as the femur, the humerus and the scapula
B. Long bones, such as the femur, the humerus and the tibia
C. Flat bones, such as the scapula, the sternum and the cranial bones
D. Short bones, such as the carpal and the tarsal bones
E. Flat bones, such as the vertebrae, the ribs and the metatarsals

5. The following bones are short bones:
A. All the bones of the upper limb, without exception
B. The bones of the wrist (carpal bones)
C. The bones of the vertebral column
D. The bones of the tarsus (tarsal bones)
E. The bones of the skull

6. Choose the correct statement(s) referring to the bone system:
A. Blood cells are formed in the red bone marrow from the spongy bones
B. Collagen makes bones flexible, while hydroxyapatite makes them hard
C. Irregular bone epiphyses are covered by articular cartilage
D. Osteoblasts are bone cells having a resorptive action
E. The medullary cavity represents the bone's central cavity

7. Choose the correct statement(s) referring to the function of bones:
A. Movement is carried out together with the skeletal muscles
B. Flexibility is ensured by hydroxyapatite
C. There are two types of ossification: intramembranous and extramembranous
D. Their support function provides support to the body
E. They ensure protection for vital organs (lungs)

8. The following statement(s) is/are true referring to the red bone marrow:
A. It has a role in haematopoiesis
B. It can be found in the spongy bones
C. It is absent in bones such as the vertebrae or the sternum

D. It has a role in the production of red blood cells, leukocytes and platelets
E. It has a role in the production of erythrocytes, thrombocytes and osteocytes

9. Irregular bones include:
A. The patellae and wormian bones
B. The carpal and tarsal bones
C. The vertebrae
D. The scapula and the ribs
E. The humerus and the femur

10. Select the flat bones from below:
A. Some of the cranial bones (the parietal)
B. The wrist bones
C. The pelvic bones
D. The cervical vertebrae
E. The scapula (the shoulder blade)

11. Choose the correct statement(s) about bones:
A. Long bones have a diaphysis delimited at each end by an epiphysis
B. Irregular bones are represented by the clavicle and the scapula
C. Wormian bones are the irregular bones of the cranial sutures
D. Cranial bones, the bones of the vertebral column and of the thoracic cavity form together the axial skeleton
E. Tarsal bones (short bones) form the wrist

12. The compact bone tissue:
A. Can be found in flat and short bones and in the epiphyses
B. Is absent from the diaphysis of long bones
C. Contains cavities with red hematopoietic marrow
D. Is a component of the diaphysis of long bones
E. Is less dense than spongy tissue

13. According to shape, bones can be classified into:
A. Flat bones (shoulder blades)
B. Sesamoid bones (the trapezium bone)
C. Irregular bones (sesamoid)
D. Short bones (tarsals)
E. Long bones (sternum)

14. It is true that long bones:
A. Belong to the skeleton of the limbs
B. Have extensive surfaces for the insertion of tendons
C. Have a diaphysis or shaft
D. Have two epiphyses and a diaphysis
E. Have two diaphyses and an epiphysis

15. The following statement(s) is/are true about the bone tissue:
A. In order to carry out their functions, bones must be hard and rigid
B. In order to carry ut their functions, bones shouldn't be flexible
C. Bone flexibility is the ability of a bone to bend to a certain degree
D. Short bones include the tarsals and carpals
E. Characteristics such as hardness and flexibility are given by osteoclasts

16. Choose the *false* statement(s) from below:
A. The axial skeleton includes all the bones of the body with the exception of the long bones of the limbs
B. The sternum and the ribs are flat bones
C. The carpals are wrist bones

D. The bones of the tarsus belong to the lower limb
E. The vertebrae belong to the flat bones

17. Choose the correct associations between the shape of the bone and its location in the skeleton:
A. Sternum – flat bone – bony pelvis
B. Vertebra – irregular bone – vertebral column
C. Patella – knee joint – irregular sesamoid bone
D. Shoulder blade – flat bone – anterior wall of the thorax
E. Short bones – tarsal bones – pelvic girdle skeleton

18. Choose the correct statement(s) referring to the functions of the bones in the body:
A. Protection – the bones of the skull protect the delicate tissues of the encephalon
B. Protection – the sternum together with the ribs contribute to the protection of certain organs in the thorax
C. Support – bones serve as points for the attachment of skeletal muscles
D. Mineral deposits, with the exception of calcium and phosphates which can be found exclusively in the soft tissues
E. The site where the figurative blood elements are formed through haemostasis

19. Choose the correct statement(s) from below:
A. The diaphysis and the epiphysis are components of bones such as the femur, tibia, shoulder blade
B. The periosteum is a cartilaginous tissue membrane which synthetises collagen in the bone mineral matrix
C. The red bone marrow is the site where blood cells are created
D. The diaphysis and epiphysis are not components of the scapula and of the vertebrae
E. The periosteum covers the diaphysis of long bones

20. Choose the true statement(s) referring to the periosteum
A. Ensures the growing in length of bones because it produces continually osteoclasts
B. It is a connective tissue which partially covers a long bone
C. The periosteum is absent from the articular surfaces of a long bone
D. It covers entirely the epiphyses of limb bones
E. It covers the long, straight part of certain bones such as the femur or the humerus

21. Which elements are part of the histological structure of the long human bone?
A. Compact bone, spongy bone, endosteum, periosteum
B. Compact bone, non-articular cartilage, metaphyseal plate
C. Two diaphyses and two epiphyses
D. A diaphysis, two epiphyses, two metaphyses
E. Spongy bone in the epiphyses, compact bone in the diaphyses, articular cartilage at the epiphyseal extremities

22. The diaphysis and the epiphysis are components of:
A. The ribs and sternum
B. Carpal bones
C. Bones of the pelvic girdle
D. Humerus, femur, ulna
E. Tibia, fibula, sternum

23. Choose the correct statement(s) referring to the histological structure of the bone:
A. The compact bone has concentric rings organised in systems called osteons
B. The osteon has perforating canals which connect the central canals to the bone canals
C. The lacunae are concentric lamellae of the osteon and they contain osteocytes
D. The concentric bone lamellae contain lacunae which contain osteocytes
E. Unlike the perforating canals, the central canal has no blood vessels

24. Choose the correct statement(s) referring to the histological structure of the bone:
A. The structural unit of the spongy tissue is the osteoclast, which reshapes the bone
B. The osteon has a central canal which contains nerves and blood capillaries
C. The haversian system is a characteristic of the compact bone

D. The osteon has a central canal called perforating canal
E. Bones can have tuberosities and trochanters which serve as places for the insertion of skeletal muscles

25. The following is true about the osteon:
A. Each osteon has a central canal which contains nerves but doesn't contain blood capillaries
B. The osteon's central canal contains blood vessels (blood capillaries) and nerves
C. It contains concentric rings (bone lamellae) surrounding each central canal
D. It contains concentric rings (bone lamellae) surrounding each perforating canal
E. It is separated from neighbouring osteons by areas containing interstitial lamellae

26. Bone cells are:
A. Bone-forming cells – osteocytes, resorbing cells - osteoclasts
B. Bone-forming cells – osteoblasts, resorbing cells - osteoclasts
C. Trapped in the bone tissue which they secrete - osteocytes
D. Osteoclasts which secrete bone-dissolving substances, providing sodium and chloride to the body
E. Osteocytes in the areas called lacunae

27. Choose the true statement(s) referring to the spongy bone tissue:
A. The epiphysis of a long bone contains spongy tissue inside
B. Flat bones consist of spongy tissue inside, in the central region
C. It consists of concentric plates (trabeculae) with cavities that contain haematogenic red bone marrow
D. It contains interconnected bony lamellae called trabeculae (plates)
E. The central canals of osteons are interconnected by perforating canals

28. Choose the true statement(s) referring to bone formation:
A. It is the result of a process called ossification
B. It is called intramembranous if it occurs in the connective membranes (in the case of long bones)
C. All the bones are formed as a result of intramembranous ossification
D. Isteoblasts are the main bone-forming cells
E. There are two types of bone formation: intramembranous for flat bones and endochondral for long bones

29. The activity of osteoblasts and osteoclasts is influenced by:
A. Parathormone (which stimulates osteoclast activity)
B. Calcitonin (which rapidly increases bone calcium deposits)
C. Thymosin (hormones secreted by the thyroid)
D. Prostaglandins (enzymes secreted by the heart, lungs, etc)
E. Sexual hormones (can affect osteoblast and osteoclast activity balance)

30. The perforating canals connect the central canals in the:
A. Epiphyseal plate
B. Periosteum
C. Compact bone
D. Osteon
E. Spongy bone

31. Choose the correct statement(s) referring to bone formation:
A. Intramembranous ossification takes place in the bones of the lower limbs
B. Endochondral ossification takes place in the diaphyseal plate
C. The growth in length of a bone ends when the epiphyseal plate turns into cartilage
D. Osteoblasts secrete the bone matrix which will contain collagen
E. Osteoclasts dissolve the bone and provide the body with phosphate and calcium

32. Choose the correct statement(s) referring to ossification:
A. There are three types of ossification: intramembranous, endochondral and intra-cartilaginous
B. There are two types of ossification: intramembranous and endochondral
C. Intramembranous ossification takes place in the flat bones of the skull
D. Intramembranous ossification takes place in the long bones of the skull and of the limbs

E. The ossification process starts approximately in the sixth week of embryonic development

33. Choose the true statement(s) from below referring to the histological structure of the bone:
A. A central canal containing nerves and blood capillaries can be found only in certain osteons
B. Each perforating canal is surrounded by concentric rings of the osteon
C. The compact bone contains a number of cells and interconnected canals called haversian canals
D. The spongy bone contains a lattice-like network of trabecullae
E. Trabecullae are lattice-like bone structures which form the spongy bone

34. Choose the correct associations:
A. Hydroxyapatite – crystalline structure – bone hardness
B. Osteoporosis – calcium loss – high resistance to fractures
C. High calcium intake – physical activity – prevention of osteoporosis
D. Osteoblasts – highly active cells – bone-dissolving substances
E. Physical activity – mechanical stress – bone formation by osteoblasts

35. The following statements are *false*:
A. Osteoclasts are formative cells, osteoblasts are resorptive cells
B. The compact bone is a dense bone which reveals osteons under the microscope
C. Sexual hormones cannot influence the activity of osteoclasts and osteoblasts
D. Bone remodelling takes places only in the sixth week of embryonic development
E. The cavities between osteons contain interstitial lamellae (incomplete osteons)

36. The following statement(s) is/are true referring to the function of bones:
A. The long bone has an axis called epiphysis and two endings called diaphyses
B. Haematopoiesis is the destruction of blood cells by lysis
C. The bone deposits calcium and phosphates
D. During bone remodelling, bones provide the body with calcium and phosphates
E. Bones provide insertion points for the skeletal muscles

37. Choose the correct statement(s) referring to the composition of bones:
A. $CaCO_3$ is found in the composition of hydroxyapatite
B. Collagen is a substance belonging to carbohydrates found in the bone matrix
C. Protein collagen fibres are responsible for bone flexibility
D. In a normal bone, calcium phosphate does not contribute to the formation of hydroxyapatite
E. $Ca_3(PO_4)_2$ is an important component of hydroxyapatite

38. Immobile or semi mobile joints include:
A. Syndesmosis between the diaphyses of the radius and the ulna
B. Diarthroses (in the limbs)
C. Synarthrosis (the suture between the frontal bone and the two parietal bones)
D. Amphiarthrosis (sacroiliac joint)
E. Gomphosis (where the tooth is anchored into the alveolus)

39. Diarthroses:
A. Are also called synovial joints
B. Have a relatively low or no mobility
C. Consist of two bone ends contained in the synovial cavity
D. Allow free movement
E. Examples of diarthroses include the following joints: elbow, shoulder, vertebral and sacroiliac

40. Choose the correct type(s) of diarthroses:
A. Pivotal (which ensure the movement of rotation)
B. Spheroidal (allow the greatest diversity of movements of all joints)
C. Semilunar (with spherical surfaces)
D. Condyloid (ellipsoid)

E. Saddle (allow the same movements as condyloid joints but have a greater freedom)

41. Choose the correct associations from below:
A. Hinge movement - trochlear joint
B. Sliding – plane joint
C. Movement in two parallel planes – ellipsoid joint
D. Movement in two perpendicular planes – ellipsoid joint
E. Rotation – plane joint

42. Synarthrosis is a joint found:
A. Between the diaphyses of the radius and the ulna, where it's called syndesmosis
B. Between the flat bones of the skull, where it's called suture
C. At the junction between the radius and the humerus, where it's called gomphosis
D. Between the vertebral bodies, where it's called intervertebral disc
E. Between the parietal bones, where it's called suture

43. The following statement(s) is/are true about the knee joint:
A. It is a saddle diarthrosis
B. It has a fibrous capsule and a synovial membrane, being a synovial joint
C. It does not have menisci, only intervertebral discs
D. It has two semilunar cartilaginous discs (menisci)
E. It joins the femur to the tibia

44. The following statement(s) referring to joins is/are true:
A. They are organs connecting bones and muscles
B. The term joint refers to the connexion between two or more bones
C. One of their classification criteria is the range of movement they allow
D. The term joint refers to the connection between muscles and ligaments
E. The term joint refers to the connection between muscles and tendons

45. The following statement(s) is/are true referring to a spheroid joint:
A. A pulley-like surface fits into a concave surface
B. It is formed by joining a round bone end with a concave surface
C. It allows the greatest diversity and freedom of movement of all joint types
D. It allows only movement in two perpendicular planes
E. It includes the shoulder joint where the head of the humerus fits into the glenoid cavity

46. A synovial joint contains the following elements:
A. Articular tendons
B. Fibrous capsule
C. Synovial cavity
D. Tectorial membrane
E. Synovial membrane

47. The following statement(s) is/are true referring to the movements in a synovial joint:
A. Flexion/extension are the movements of decreasing/increasing the angle between two bones of a joint
B. In the knee joint, flexion means bending the joint and extension means straightening it
C. Flexion/extension are movements which do not alter the angle between two bones of the joint
D. Adduction/abduction are the movements of pulling a part towards/away from the midline of the body
E. Pronation is the rotating movement of the hand, with the palm facing upwards

48. Choose the true statements from below:
A. Abduction is the pulling of a limb away from the midline of the body
B. Abduction, also called protraction, is the vertical raising of the arm
C. Adduction is the rotation of a limb towards or away from the midline of the body
D. In supine position, the palm lies in anatomical position facing forward

E. Raising the shoulders (shrugging) is an example of elevation

49. Choose the correct statement(s) referring to the joints of the lower limb:
A. The joint between the femur and the acetabulum is an example of trochlear joint
B. The joint between the femur and the acetabulum is an example of spheroidal joint
C. The pubic symphysis is an amphiarthrosis, also found in the bony pelvis
D. A saddle joint is a joint between tarsal bones and metacarpal bones
E. Menisci have a semilunar shape and there are two of them for each knee

50. Choose the correct statement(s) referring to the joints of the upper limb:
A. Interphalangeal joints are a type of trochlear diarthrosis
B. There is a special type of synarthrosis between the humerus and the ulna, called syndesmosis
C. The saddle amphiarthrosis is formed between the first metacarpal and the trapezium
D. A saddle diarthrosis is formed between the first metacarpal and the trapezium
E. The elbow joint is formed exclusively between the radius and the humerus

CHAPTER 5 ▸ The muscular system

1. The following statement(s) is/are true about the muscular tissue:
A. It is one of the body's four main tissues (together with the epithelial, cartilaginous and fibrous tissues)
B. It is one of the body's four main tissues (together with the epithelial, connective and nervous tissues)
C. Its structural unit is the sarcomere (for the smooth muscle fibre)
D. Its structural unit is the muscle cell, also called muscle fibre
E. Anatomically, the terms muscle cell and muscle fibre are considered as opposite structures

2. The muscle tissue will form:
A. Skeletal striated muscles
B. The organs responsible for body movements
C. The organs which prevent the movement of body segments, but ensure the movement of the body as a whole
D. Bones which provide insertion points for muscles
E. Joints which mobilise bones and muscles

3. The following types of muscles form the muscular system:
A. Striated (skeletal) muscles, under involuntary control
B. Striated (skeletal) muscles, under voluntary control
C. Smooth muscles which trigger spontaneous, involuntary contractions
D. Visceral muscles responsible for voluntary contractions
E. The myocardium (heart muscle) which has involuntary, rhythmical contractions

4. Choose the correct associations referring to the three types of muscle tissue:
A. Skeletal striated muscle – blood vessels, some ducts – cardiac wall
B. Multiple nuclei – skeletal striated tissue - myocardium
C. Central single nucleus – smooth muscle tissue, myocardium
D. Sarcomeres – skeletal striated muscle tissue – cardiac muscle tissue
E. Intercalated discs – smooth muscle tissue

5. Choose the statements which describe accurately the differences between the striated skeletal muscle and the cardiac muscle:
A. They have different locations, the striated skeletal muscle being inserted onto the bones
B. They have different locations, the cardiac muscle being also located in the walls of the heart's blood vessels
C. The striated skeletal muscle fibre is multinucleated, while the cardiac muscle fibre has a single nucleus
D. The striated skeletal muscle has a much slower contraction speed than the cardiac muscle
E. The striated skeletal muscle has a much faster contraction speed than the cardiac muscle

6. Choose the true statement(s) referring to the muscle tissue:
A. It is one of the four main tissues in the body
B. It has the ability to contract
C. It has the ability to perform mechanical work
D. The muscle cell (fibre) is the structural unit of the muscle tissue
E. The muscle cell can be cubical or cylindrical, being called muscle fibre

7. The shape of muscle fibres in the various types of muscles can be:
A. Elongated, cylindrical with sharp ends in striated skeletal muscles
B. Elongated, cylindrical with rounded ends in striated skeletal muscles
C. Cylindrical, branched in smooth muscles
D. Elongated with thinner ends in striated skeletal muscles
E. Fusiform with sharp ends in smooth muscles

8. The following statement(s) is/are true referring to the smooth muscle:
A. It can be unitary and multi-unit

B. The fibres of unitary smooth muscle have gap junctions
C. The fibres of the multi-unit smooth muscle act in a coordinated, tightly interdependent fashion
D. The smooth muscle fibre receives nerve impulses from the vegetative (autonomic) nerves
E. It contains intermediate, contractile filaments, attached to the dense bodies in the entire cell

9. The following statement(s) is/are true about the cardiac muscle:
A. It receives impulses generated by the cells of the excito-conductor system
B. It is not under voluntary nervous control
C. It has elongated and always unramified muscle fibres
D. It has a striated microscopic aspect
E. It has intercalated discs, common to all muscle tissue types

10. Choose the true statement(s) referring to the striated skeletal muscle:
A. The striated aspect is given by the absence of sarcomeres
B. Their tubular arrangement consists in two tubes/sarcomeres, located at the A – I junctions
C. It is controlled by the vegetative nervous system
D. It is controlled by the somatic nervous system
E. It has intercalated discs with gap junctions and desmosomes

11. Which of the following statements characterize(s) the cardiac muscle?
A. It is present in the structure of heart blood vessels (coronary vessels)
B. It is present only in the structure of the heart (in the heart wall)
C. Its fibres (often ramified) form a real network with adjacent fibres
D. Intercalated discs tightly connect the central parts of myocardial fibres
E. Intercalated discs facilitate the propagation of contractions from one cell to the other

12. The following statement(s) is/are true about the smooth muscle:
A. It cytoplasm contains actin and myosin filaments, forming similar structures to that of microfibrils
B. The contraction of the rectum wall muscle contributes to the elimination of the rectal content
C. It has well-structured neuromuscular junctions
D. It has diffuse junctions where neurotransmitters are released
E. It can be classified into multi-unit and pluriunit smooth muscle

13. Which of the following statements is/are characteristic for the structure of the striated skeletal muscle fibre?
A. Each fibre contains 4-20 myofibrils, with a diameter greater than 100µ
B. Each fibre contains 4-20 filiform filaments with a length up to 100µ
C. The cytoplasm of the striated muscle fibre is called sarcoplasm and has a low number of mitochondria
D. In sarcomeres, myofibrils are organised along their longitudinal axis
E. The repetitive distribution of sarcomeres gives them their characteristic striated aspect

14. The microscopic aspect of the sarcomere shows:
A. The presence of two types of myofilaments (actin and myosin), arranged parallel to each other
B. The arrangement of thin actin filaments perpendicular on myosin filaments
C. The presence of Z-line – the area in which the actin filaments of two adjacent sarcomeres are interconnected
D. The formation of the A-band by the superposition of actin filaments
E. The clear band divided into two equal halves by the Z-line is called I-band

15. The following statement(s) is/are true about the microscopic structure of the sarcomere:
A. There are two types of myofilaments, thick actin filaments and thin myosin filaments
B. Thin actin myofilaments and thick myosin myofilaments are arranged parallel to each other
C. Myofilaments are perpendicular on each other
D. The A-band is divided into two equal halves by the H zone which contains only myosin filaments
E. Thick filaments consist of myosin, a protein formed of two polypeptide chains twisted around each other

16. The actin filament:
A. Is thin and consists of a helix-like glycoprotein substance

B. Is thin and looks like a helix formed of two polypeptide chains twisted around each other
C. Contains another protein, tropomyosin, located at regular intervals along its length
D. Is structured as a double helix consisting of three twisted protein chains
E. Contains tropomyosin molecules in the groove of the helix

17. The red muscle:
A. Contains a large quantity of myoglobin, an oxygen-storing protein
B. Is a slow or oxidative muscle
C. Is a glycolytic, fast muscle which contains a large quantity of glucose
D. It can contract repeatedly but it can't withstand muscle fatigue
E. It can withstand muscle fatigue, due to the oxygen stored in the myoglobin, which will be used in cellular respiration

18. The white muscle:
A. Contains a large quantity of reddish myoglobin
B. Is a slow, oxidative muscle, which uses the oxygen in the haemoglobin stored in its fibres
C. Is a fast, glycolytic muscle (so called due to its high glycogen content)
D. Rapidly uses ATP (adenosine triphosphate acid) but it cannot replace it as fast as it uses it
E. It has very little available oxygen necessary for cellular respiration

19. The following statement(s) is/are true about calcium ions (Ca^{2+}) in the muscle fibre:
A. Normally, in a resting cell, their concentration is very low in the sarcoplasm
B. They are constantly pumped out of or into the cell in the cell's specialised smooth endoplasmic reticulum (sarcoplasmic reticulum)
C. They are stored in the mitochondria and nucleoli reservoir
D. They are stored in the sarcoplasm reticulum reservoir and on the transverse tubule system (T tubules)
E. Once they get into the troponin microfilaments, they attach to the myosin molecule sites

20. During the greatest muscle contraction in skeletal muscles:
A. The thin actin filaments are superposed
B. The enzyme activity of adenosine triphosphate increases
C. H-bands come closer to A-bands
D. Sarcomeres reach their smallest size
E. The H-zone disappeared and the I-band greatly decreased in size

21. Filament sliding cycles in striated muscles:
A. Take place as long as adenosine triphosphate is available
B. Take place very quickly, at millions of myosin ends
C. Take place slowly, at both ends of the sarcomere
D. Induce muscle relaxation by shortening sarcomeres
E. Take place as long as there is a nerve stimulus

22. Myoglobin:
A. Is present in large quantities in red muscle fibres
B. Is present in large quantities in white muscle fibres
C. Is the muscle pigment which stores oxygen necessary for cellular respiration
D. Is the muscle molecule which stores adenosine triphosphate
E. Is one of the muscle contractile proteins, together with adenosine

23. A neuromuscular junction consists of:
A. A single muscle fibre, very close to the nerve ending, but without touching it
B. The end of a single nerve cell which touches the sarcolemma of the muscle fibre
C. The end of a single nerve cell which does not touch the sarcolemma of the muscle fibre
D. The synaptic cleft – a fluid filled space
E. A space filled with synovial fluid, called synaptic cleft

24. Acetylcholine:
A. Is released in the synaptic cleft of the neuromuscular junction
B. Is a neurotransmitter which can also be released by certain neurons in the encephalon
C. Is bound to the receptors on the presynaptic membrane of the motor neuron
D. Is released from the synaptic vesicles into the synaptic cleft by endocytosis
E. Is bound to the receptors on the cellular membrane of the muscle fibre (sarcolemma)

25. Muscle contraction requires the following:
A. Acetylcholine - neurotransmitter
B. Adenosine triphosphate – a compound which does not have high energy phosphate links
C. Adrenalin – the hormone of the suprarenal cortex
D. Calcium ions (Ca^{2+}) which act before the sodium influx
E. Sodium ions (Na^{+}) which permeate the cell when acetylcholine is bound to the sarcolemma receptors

26. The necessary calcium required for a muscle contraction is provided by:
A. The sarcoplasmic reticulum
B. The transverse tubules (T system)
C. Myoglobin (a protein)
D. The proximal convoluted tubules (T system)
E. Mitochondria (electron transport system)

27. In order to induce muscle contraction, calcium is bound to:
A. Tropomyosin – a contractile protein
B. Troponin – at certain binding sites
C. Troponin – at the actin cross bridges
D. Actin – helix structured protein
E. Troponin – bound to myosin

28. Which of the following substances are involved in the contraction of the striated skeletal muscle?:
A. Actin – myosin
B. Acetylcholine – STH
C. Myoglobin – myosin
D. Ionic calcium (Ca^{+}) – ionic sodium (Na^{2+})
E. Adrenalin – noradrenalin

29. Muscle relaxation:
A. Requires calcium release from the sarcoplasmic reticulum
B. Takes place when there are no more nerve impulses to stimulate the muscle
C. Requires the pumping of calcium into the terminal cisternae
D. Takes place by reverting troponin to its resting configuration, which causes tropomyosin to cover the sites where myosin binds to actin filaments
E. Takes place by binding calcium to tropomyosin, which induces alterations in the configuration of the latter

30. During muscle relaxation:
A. Stimulation occurs when acetylcholine is released by a motor neuron
B. Calcium ions are actively transported into the T tubules and the sarcoplasmic reticulum
C. Calcium ions diffuse from the sarcoplasmic reticulum
D. Calcium ions are bound to troponin molecules
E. Cross bridges between actin and myosin filaments are broken

31. During muscle contraction:
A. Acetylcholine is decomposed by cholinesterase
B. Calcium ions are actively transported into the T tubules and the sarcoplasmic reticulum
C. Acetylcholine crosses the synaptic cleft at the neuromuscular junction
D. The sarcomere becomes shorter
E. Cross bridges between actin and myosin filaments are formed

32. The motor unit:
A. May contain a variable number of muscle fibres
B. Represents the functional unit of the striated skeletal muscle
C. Is represented by a muscle fibre together with all the sensory neurons which innervate it
D. Is represented by a motor neuron together with all the muscle fibres which it stimulates
E. Can contain a maximum of 10 muscle fibres

33. Unlike smooth muscle fibres, striated muscle fibres contain:
A. Sarcomeres
B. Striations
C. Troponin
D. Tropomyosin
E. Calmodulin

34. Adenosine triphosphate in muscle cells:
A. Is decomposed by enzymes into adenosine diphosphate and an inorganic phosphate group
B. Is necessary for the relaxation of the muscle fibre
C. Is necessary for the passive transport of calcium and sodium ions during contraction
D. Is necessary for the release of sodium ions from the T tubules during muscle fibre relaxation
E. Represents a limited reserve which has to be constantly regenerated

35. Choose the correct statement(s) from below:
A. The muscle's sustained maximal contraction is called a twitch
B. The muscle as a whole, just like the individual muscle fibre, functions according to the law „all or nothing"
C. The muscle's sustained maximal contraction is called tetanus
D. Muscle tone is the muscle's partial contraction, maintained over a long period of time
E. Orthostasis does not require muscle tone, being induced by gravity

36. The energy used for muscle contraction:
A. Derives from adenosine triphosphate which will be decomposed by enzymes under the action of ATP-ase
B. Is produced by the mitochondria where reactions of the process of cellular respiration take place
C. Is produced by the decomposition of the pigment called myoglobin, which stores oxygen
D. Ends when a muscle has been inactive for a longer period of time
E. Derives from carbohydrate metabolism when ATP (adenosine triphosphate) and phosphocreatine reserves have been exhausted

37. Lactic acid is produced as a result of:
A. Prolonged anaerobic cellular processes which induce pyruvic acid conversion
B. Anaerobic processes of the cellular respiration (Krebs cycle, chemiosmosis)
C. The degradation of adenosine triphosphate into adenosine diphosphate with the activation of electron transport system
D. The conversion of pyruvic acid when the cell's oxygen reserve has been exhausted
E. The degradation of myoglobin which irreversibly binds oxygen

38. Which of the following statements below referring to the organic substances in muscles is/are correct?:
A. Troponin is a glycoprotein which binds the calcium in the skeletal muscle fibre
B. Myoglobin is the pigment which binds oxygen molecules and temporarily stores them in the muscle
C. Haemoglobin is present in the muscle fibre, near the myofibrils, which they supply with oxygen
D. Adenosine triphosphate can be found in unlimited amounts in the muscle fibre
E. Myosin filaments have golf-club-shaped endings oriented laterally

39. ATP-ase:
A. Is a protein found at the ends of actin filaments
B. Is an enzyme found at the ends of myosin filaments
C. Degrades ATP (adenosine triphosphate) into ADP (adenosine diphosphate) and a phosphate group, releasing energy from the molecule

D. Regenerates ATP (adenosine triphosphate) from AMP (adenosine monophosphate) and phosphate, releasing energy from the molecule
E. Transfers a phosphate group to an AMP (adenosine monophosphate) molecule, to regenerate an ATP (adenosine triphosphate) molecule

40. Phosphocreatine:
A. Also called creatine pyrophosphate contains high-energy phosphate bonds
B. Also called creatine phosphate, can be found on the ends of myosin filaments
C. Represent a cellular energy deposit, containing high-energy phosphate bonds
D. Acting like an enzyme, it decomposes ATP (adenosine triphosphate) into AMP (adenosine monophosphate) and phosphate groups
E. Transfers a phosphate group to an ADP (adenosine diphosphate) molecule in order to regenerate an ATP (adenosine triphosphate) molecule

41. The following statement(s) is/are true about myoglobin:
A. It represents the molecule which contains heme and carries oxygen to the erythrocytes
B. It binds oxygen molecules and stores them temporarily in the muscles
C. Its presence in the muscle fibre decreases the necessity of a constant oxygen supply to the muscle during contraction
D. It represents a deposit of high-energy phosphate bonds
E. It participates in the completion of Krebs cycle

42. The smooth muscle tissue:
A. Does not contain actin and myosin filaments but contains tropomyosin and calmodulin
B. Does not have striations
C. Is present in the walls of certain viscera (stomach, uterus, rectum)
D. Contains cells interconnected by collagen fibres and sometimes by gap junctions
E. Is absent from the viscera but is present in blood vessels and certain ducts

43. Smooth muscle cells are interconnected by:
A. Actin, collagen and reticulin filaments
B. Elastin and collagen fibres
C. Collagen fibres and sometimes by gap junctions
D. Well-structured neuromuscular junctions
E. Intercalated discs with several desmosomes

44. The fibres of the unitary smooth muscle:
A. Contract rhythmically, like a unit
B. Are interconnected by gap junctions
C. Do not contain gap junctions
D. Are not present in the wall of the airways
E. Are present in the wall of large arteries

45. The fibres of the multi unitary smooth muscle:
A. Contract in tight dependence to one another
B. Contain few gap junctions
C. Are present in the urinary tract wall
D. Form the hair erector muscles
E. Are present in the wall of large arteries

46. The following statement(s) is/are true referring to cardiac muscle cells:
A. They are elongated and cylindrical, longer than striated skeletal cells
B. They are ramified, shorter and wider than striated skeletal cells
C. They are interconnected by gap junctions and by desmosomes
D. They are interconnected by intercalated discs, which are also characteristic for the striated skeletal tissue
E. They often branch out forming a real network with the neighbouring cells

47. The following statement(s) is/are true about the structure of the skeletal muscle fibre:
A. Myofibrils run along the transverse axis in sarcomeres
B. The repetitive distribution of sarcomeres gives the muscle its characteristic striated aspect
C. The clear bands are called A bands and are divided in the middle by Z lines
D. The clear bands, called I bands, are wide and contain actin
E. Thin filaments consist of actin (contractile protein in the structure of myofibrils)

48. Muscle fibres contain:
A. Proteins – myosin, troponin, actin in the striated muscle
B. Protein – calmodulin, in the smooth muscle
C. Troponin, calcium-fixating protein in the smooth muscle
D. Actin and myosin in a 1: 16 ratio in the smooth muscle
E. Calcium ions (Ca^{3+}) in the intracellular sarcoplasmic reticulum in the smooth muscle

49. Striated skeletal muscles:
A. Are responsible for the motor activity of certain segments of the digestive tract (stomach, small bowel)
B. Is inserted on bones, the muscle – bone unit ensuring the movements of the body and its various segments
C. Are responsible for the complex act of locomotion
D. Can act by triggering body part movements in opposite directions, when they are antagonistic muscles
E. Can never act one against the other (antagonistic) during the complex act of locomotion

50. Choose the true statement(s) from below:
A. Adenosine triphosphate acid (ATP) regenerates during muscle contraction due to the energy released by anaerobic glycolysis (three ATP molecules/synthesized glucose molecule)
B. Adenosine triphosphate acid (ATP) regenerates during muscle contraction due to the energy released by anaerobic glycolysis (two ATP molecules/mol of split glucose)
C. The synthesis of the creatine phosphate molecule is generated by the energy resulting from splitting an ATP (adenosine triphosphate) molecule
D. Phosphocreatine decomposition regenerates ATP (adenosine triphosphate), when the latter is exhausted
E. The energy required by microfilament sliding comes from the oxidative aerobic decomposition of glucose resulting in lactic acid

CHAPTER 6 ▸ The digestive system

1. Choose the correct statement(s) referring to the digestive system:

A. It is responsible with providing oxygen to the cells and with removing carbon dioxide resulting from cell metabolism
B. Consists of the gastrointestinal tract and accessory organs
C. It is responsible for the breaking down the large molecules in food into small molecules and for the absorption of small molecules, of water and of minerals in the body
D. It has a role in hormone transport from the endocrine glands to their target cells
E. It is responsible for the breaking down the large molecules in food into small molecules and for eliminating small molecules, water and minerals from the body

2. The following statement(s) referring to the digestive system is/are *not true*:

A. It is a part of the gastrointestinal tract
B. The tubular organs which make it up are represented by the salivary glands and the liver
C. One of its functions is the digestion of food and absorption of nutrients
D. One of its functions is the regulation of blood plasma volume
E. It consists of the gastrointestinal tract and a number of accessory organs

3. Which of the anatomical structures below belong to the digestive system?

A. The oral cavity, the oesophagus, the large bowel
B. The nasal cavity, the oropharynx, the oesophagus
C. The stomach, the small bowel, the large bowel
D. The liver, the pancreas, the parathyroid glands
E. The parotid glands, the liver, the pancreas

4. The following structures are a part of the gastrointestinal tract:

A. The oral cavity (mouth) and the pharynx – the first segments of the gastrointestinal tract
B. The oesophagus, situated in the continuation of the pharynx
C. The stomach and the liver – accessory organs of the digestive system
D. The duodenum and the pancreas – tubular organs of the gastrointestinal tract
E. The large bowel, the terminal segment of the gastrointestinal tract

5. The tunics of the gastrointestinal tract are:

A. The innermost tunic – the serous layer (the parietal layer of the peritoneum)
B. The external tunic – the serous layer (the visceral layer of the peritoneum)
C. The submucosa, located exterior to the mucosa
D. The submucosa, which contains blood vessels, lymph vessels and nerves
E. A tunic which in the small bowel contains striated muscles arranged in longitudinal and circular pattern

6. The smooth muscles in the wall of the gastrointestinal tract play the following roles:

A. The oblique ones shorten its length during contraction
B. The longitudinal ones reduce its diameter during contraction
C. The circular ones reduce its diameter during contraction
D. The longitudinal ones shorten its length during contraction
E. The oblique ones in the stomach increase its length and its diameter during contraction

7. The external tunic of the gastrointestinal tract:

A. Is also called the *serosa* or serous layer
B. Consists of two layers – visceral, which lines the abdominal cavity, and parietal which wraps the external wall of most abdominopelvic organs
C. Is represented by the visceral peritoneum which, together with the parietal one delimit the intraperitoneal cavity
D. Has a multi-stratified extension – the mesentery – which supports a small part of the abdominal organs
E. Has a double-stratified extension – the mesentery – which supports most of the abdominal organs

8. The walls of the gastrointestinal tract consist of the following tunics:

A. The mucosa – the innermost tunic, which contains enzyme and mucus secreting glands
B. The submucosa – which contains blood vessels, lymph vessels and nerves
C. The muscular – consisting of striated muscles arranged longitudinally, circularly and obliquely in the stomach
D. The serosa – the external tunic represented by the parietal peritoneum which lines the abdominal cavity
E. The serosa – which secretes a fluid that lubricates the external surface of the organs and allows them to slide freely

9. Choose the *false* statements referring to the external runic of the gastrointestinal tract:
A. It consists of the parietal peritoneum, continuing with the visceral peritoneum which lines the abdominal cavity
B. Its cells secrete a fluid that washes the external surface of the organs and allows them to slide freely
C. It is called the serosa or serous layer
D. It consists of a double-stratified mesentery
E. It contains mucus-secreting glands which serve to protect the tissues of the gastrointestinal tract

10. The visceral peritoneum:
A. Forms the external tunic of the gastrointestinal tract
B. Is continuous with the parietal peritoneum
C. Forms the internal tunic of the gastrointestinal tract
D. Contains cells that secrete a fluid which lubricates the external surface of the organs
E. Together with the parietal peritoneum, they form a space called „peritoneal cavity"

11. The following statements referring to the oral cavity are *false*:
A. It communicates anteriorly with the oropharynx and it has no gustatory function
B. Its functions include the ingestion and mechanical digestion of food, which it breaks down into smaller pieces and combines with saliva
C. The palate of the oral cavity consists of the hard palate and the soft palate
D. It mixes food with gastric secretions, and it has a gustatory and a masticatory function
E. It represents the first segment of the gastrointestinal tract

12. The functions of the oral cavity are as follows:
A. Ingestion of food
B. Gustatory function
C. Elimination of digested food
D. Mechanical digestion of food
E. Lubrication of food

13. Choose the statements which contain two true assertions, both referring to anatomical characteristics of certain structures of the oral cavity:
A. The tongue is connected to the soft palace by the lingual frenulum. Taste buds are a part of the taste papillae
B. The tongue turns food into food bolus. The incisors cut the food
C. The canines have a conical shape. The tongue consists of striated muscles
D. The basic structure of a tooth consists of the crown, the neck and the root. The external surface of a tooth is covered with enamel
E. The premolars are flat teeth. Premolars serve to tear/grind food

14. In the oral cavity:
A. Canines cut larger pieces of food
B. Incisors cut large pieces of food
C. Canines grab and tear food
D. Incisors grind cut food into smaller pieces/grind food
E. Premolars and molars cut food into smaller pieces/grind food

15. In the oral cavity:
A. The tongue turns food into food bolus with the help of saliva
B. Teeth turn food into food bolus with the help of saliva
C. Teeth carry out the mechanical digestion of food
D. The tongue carries out the mechanical digestion of food
E. Food is mixed with salivary secretions

16. Choose the true statement(s) referring to the teeth:
A. There are two types of teeth: deciduous and temporary
B. The milk teeth are 20 in number and they are usually lost by the age of 6, being replaced by permanent teeth
C. Permanent teeth form 32 pairs and replace deciduous teeth
D. Teeth consist of crown, body and root
E. Teeth consist of incisors, canines, premolars and molars

17. Choose the correct association referring to the teeth:
A. Incisors – crown, body and root – cutting large pieces of food
B. Canines – conical shape – grabbing and tearing food
C. Premolars – flat teeth – cutting into smaller pieces/grinding food
D. Central incisors – cutting large pieces of food – break through at the ages 7 - 21
E. Molars – flat teeth - cutting food into smaller pieces

18. Dental enamel:
A. Is one of a tooth's main components
B. Is the toughest substance in the body
C. Can be found on the tooth's inner surface
D. Mainly consists in calcium salts (major component of hydroxyapatite)
E. Surrounds the tooth's pulp

19. Dental enamel: *false* statements:
A. Is covered by the tooth's crown and covers dentin
B. Lies on the tooth's external surface
C. It is very hard, but not as hard as dentin
D. Contains hydroxyapatite in its structure, a mineral complex
E. Forms the largest part of the tooth

20. Dentin:
A. Is one of the tooth's main components
B. Is softer than dental enamel
C. Lies on the tooth's external surface
D. Mainly consists of organic components and does not contain hydroxyapatite
E. Surrounds the tooth's pulp, being located inferior to the enamel

21. Dentin – *false* statements:
A. Surrounds the tooth's pulp, which is vascularised and innervated
B. Is softer than dental enamel
C. Lies under the enamel and represents the tooth's largest part
D. Mainly consists of hydroxyapatite, having the same hardness as enamel
E. Contains blood vessels, nerves and the tooth's connective tissue

22. Dental pulp:
A. Is the hardest substance in the body
B. Is located inside the tooth, in the pulp cavity
C. Is surrounded by dentin, covered by enamel
D. Mainly consists of hydroxyapatite
E. Contains blood vessels, nerves and the tooth's connective tissue

23. The following statement(s) is/are true about the palate – the structure the forms the roof of the mouth:
A. It consists of a hard anterior part and a soft back part
B. The anterior part of the palate is called the soft palate
C. The uvula projects inferiorly from the hard palate
D. The uvula represents a conic projection of the soft palate
E. The tongue is inserted to the roof of the oral cavity

24. Choose the *false* statements about the pharynx and the oesophagus:
A. The pharynx is a segment that is common with the respiratory tract
B. The oesophagus is the first segment which displays the three layers of the gastrointestinal tract
C. The oesophagus crosses the diaphragm from the thoracic cavity to the abdominal cavity
D. The oesophagus extends to the pyloric sphincter, where the stomach begins
E. The pharynx pushes the food bolus to the oesophagus

25. The tonsils:
A. Consist in a bundle of lymphatic tissue located in the mucosa
B. Are of three types: palatine, pharyngeal, lingual
C. Belong to the lymphatic system
D. Have a role in the body's defence
E. Are of three types: submaxillary, submandibular, sublingual

26. The following statement(s) is/are *false* about the tonsils:
A. They are bundles of smooth muscle tissue
B. The enlargement of the pharyngeal tonsil results in the formation of palatine masses
C. Their role in the respiratory system is to protect against airborne pathogens
D. They secrete enzymes and mucus which play a role in digestion
E. Palatine tonsils have a similar function to that of the pharyngeal tonsil

27. Swallowing requires coordinated activities of:
A. The tongue, which pushes the food bolus into the pharynx
B. The soft palate, the pharynx and the oesophagus
C. The pharynx, but not the oesophagus
D. The oesophagus which pushes the food bolus to the stomach
E. The stomach, which evacuates food to the large bowel

28. The following statement(s) is/are true about deglutition and peristalsis:
A. During deglutition, the tongue depresses and presses food to the roof of the mouth
B. During deglutition, the tongue elevates and presses the bolus to the hard palate, pushing it towards the pharynx
C. The food bolus enters the oesophagus after having passed the epiglottis which covers the pharynx
D. Once it passes the epiglottis which covers the larynx, the food bolus enters the oesophagus
E. Oesophageal peristalsis refers to the occurrence of contraction waves of the oesophageal smooth muscle layer (waves which push the food bolus to the stomach)

29. Choose the true statement(s) referring to the salivary glands:
A. They are considered accessory organs of the digestive system
B. They have a gustatory function, due to the lingual papillae
C. The largest salivary gland is the parotid gland, a paired gland
D. Salivary amylase is the enzyme secreted by the salivary gland serosa
E. There are two types of small salivary glands

30. Salivary glands have the following functions:
A. The saliva they produce facilitates the lubrication and cohesion of food particles
B. They secrete enzymes which initiate the carbohydrate digestion process
C. They ensure the gastric absorption of food
D. They are responsible for amylase secretion, an enzyme which turns starch and glycogen into disaccharides (maltose)
E. They ensure food-protein decomposition to the stage of dipeptides

31. The following statement(s) is/are true about salivary amylase:
A. It participates in the processes of mechanical digestion
B. It initiates the processes of chemical digestion of starch molecules until the stage of disaccharides
C. It is secreted by the serous cells of the salivary glands

D. It breaks down starch and glycogen to the stage of maltose
E. It participates in the breaking down of monosaccharides

32. The large salivary glands:
A. Contain amylase-secreting serous cells
B. Contain the parotid duct (the parotid gland)
C. Contain sublingual ducts (the submaxillary gland)
D. Play a role in pushing the food bolus to the pharynx
E. Are represented by the parotid, submandibular and sublingual glands

33. The following statement(s) is/are true about the secretions of the salivary glands:
A. They are represented by saliva, which contains amylase and mucus
B. They are produced by mucous cells
C. The facilitate the binding of food particles (with the help of the mucus)
D. They initiate lipid digestion (with the help of salivary amylase)
E. They lubricate food contributing to the formation of the food bolus

34. Choose the true statement(s) referring to the stomach:
A. It is situated in the upper left quadrant of the abdomen, immediately above the diaphragm
B. It extends from the cardiac sphincter to the pyloric sphincter
C. Its wall consists of four tunics, the muscular tunic having three striated layers: circular, longitudinal and oblique
D. It is a „J" -shaped organ
E. It communicates with the duodenum through the pyloric sphincter

35. The following structures belong to the stomach:
A. Convex lateral surface – the large curvature, and the medial surface – the lesser curvature
B. The medial convex surface – the lesser curvature connected to the pancreas
C. The fundus (fornix) and the body (the main part)
D. The pyloric antrum, a narrow distal part
E. The inferior oesophageal sphincter (the cardiac sphincter)

36. The stomach has the following functions:
A. To lubricate food with the help of the salivary mucus it secretes
B. To produce enzymes which finalise the digestion process
C. The absorption of small amounts of water, glucose, ions and alcohol by the gastric mucosa
D. The secretion of hydrochloric acid by the parietal cells
E. To evacuate the gastric chyme into the small bowel through the pyloric sphincter

37. The enzymes in the gastric juice which ensure protein digestion are represented by:
A. Pepsin, secreted in active form by the main cells of the gastric glands
B. Pepsin, secreted in inactive form and which will be subsequently activated by the hydrochloric acid
C. The intrinsic factor, which ensures the unbinding of vitamin B_{12} in the small bowel
D. Labferment (produced only in the stomach of infants, but not in adults) coagulates the proteins in milk
E. Gastrin, which controls pepsinogen secretion

38. Choose the statements describe correctly the position of the oesophagus and of the stomach in the body:
A. The stomach is situated in the upper abdominal cavity, in the umbilical region
B. The stomach is situated in the upper left part of the abdomen
C. The oesophagus penetrates the diaphragm through the oesophageal hiatus
D. The stomach lies with its medial concave surface (the lesser curvature) oriented towards the liver
E. The oesophagus lies entirely in the abdominal subdivision of the abdominopelvic cavity

39. The following statement(s) is/are true about the gastric chyme:
A. It is a fluid mixture

B. It results from the mixing and solidifying of the food bolus
C. It results from the mixing and breakdown of the food bolus under the action of the muscle layers in the stomach wall
D. It is expelled through the cardiac sphincter into the duodenum by peristaltic contractions
E. Its expulsion into the small bowel, where most of the digestion takes place, is done through the pyloric sphincter

40. Gastric juice contains:
A. Hydrochloric acid, water, ions
B. Intrinsic factor, necessary for vitamin B_{12} excretion
C. Pepsin, which breaks large proteins down into peptides
D. Mucus, which protects the stomach wall against autodigestion
E. Amylase, which digests a small amount of starch

41. Which of the elements below belong(s) to the small bowel?
A. The duodenum, the first segment, where the gastric chyme is expelled from the stomach
B. The jejunum and ileum, the main site of absorption
C. The jejunum of about 2.5 metres and the ileum of about 3.5 – 4 metres long
D. The duodenum, which extends from the pyloric sphincter to the ileocecal valve
E. The cecum and vermiform appendix

42. The following statement(s) is/are true referring to the internal surface of the jejunum and ileum:
A. It is decreased due to the presence of villi and microvilli
B. It is increased by the presence of thousands of villi (finger-like projections of the submucosa)
C. It is increased due to the presence of thousands of villi and microvilli
D. It has projections of the mucosa which contain blood capillaries and central lymphatic capillary (lacteal)
E. It has villi and microvilli (the latter being electron microscopic projections of the cell membranes in the mucosa)

43. Which of the following enzymes are involved in carbohydrate digestion?
A. Pancreatic amylase, which digests starch and yields maltose
B. Salivary amylase, which acts on the maltose substratum, yielding starch
C. Lactase, a disaccharide which produces glucose and galactose
D. Pepsin, activated from the pepsinogen precursor
E. Nuclease, which acts on nucleic acids

44. Choose the true statement(s) about lipid digestion:
A. Bile emulsifies large lipid droplets, called mycelia
B. Bile emulsifies small lipid droplets, called mycelia
C. Mycelia are the forms under which triglycerides are transported
D. Mycelia are the forms under which fatty acids and monoglycerides are transported
E. The emulsification process facilitates lipase action

45. The large bowel consists of:
A. The cecum and the vermiform appendix
B. The ascending colon which lies vertically on the right of the abdomen
C. The descending colon which continues with the ascending colon
D. The sigmoid colon which is the continuation of the transverse colon and continues with the rectum
E. The transverse colon which horizontally crosses the abdomen, near the stomach and the spleen

46. Choose the correct associations from below:
A. Vermiform appendix – vermicular projection – vestigial organs
B. Haustration – dilatation of the small bowel wall – small-pouch aspect
C. Caecum – horizontal position in the epigastrium – the first portion of the large bowel
D. Ascending colon – vertical position – extending to the inferior border of the liver
E. Descending colon – continues the transverse colon – starts at the splenic flexure

47. The functions of the large bowel include:

A. Protein absorption by osmosis
B. Water absorption, about 300-400 ml daily
C. Ion absorption (mainly Na^+)
D. Chemical food digestion
E. The formation of faeces which will be discharged by defecation

48. Choose the true statement(s) referring to the liver:

A. It is the largest endocrine gland in the body
B. It is situated under the diaphragm and it is divided into four lobes: right, left, quadrate and caudate
C. Produces bile deposited in the gall bladder
D. The lobes of the liver are subdivided into lobules which contain hepatocytes and macrophages
E. The liver is supplied with oxygenated blood and nutrients by the portal vein

49. The functions of the liver are:

A. Glycogen deposition from gluconeogenesis, when glucose blood levels increase
B. Glycogen deposition by glycogenogenesis, when glucose blood level is high
C. The site of gluconeogenesis, when blood sugar levels are low
D. Enzyme production (for example acetyl coenzyme A) which initiates the process of digestion
E. Vitamin deposition such as vitamins A, B_{12}, D, E, K

50. The following statement(s) referring to the pancreas is/are true:

A. It is an accessory organ of the digestive system, together with the salivary glands (sublingual, submandibular and parathyroid) and the liver
B. It is situated in the abdominal cavity, posterior to the stomach
C. It has both a digestive and an immune function
D. It contains cells that contribute to digestion and are organised in acini
E. Communicates with the duodenum via two ducts (the pancreatic duct and the accessory duct)

CHAPTER 7 ▸ Blood and the cardiovascular system

1. Choose the true statement(s) referring to blood:
A. It transports respiratory gases to and from the lungs
B. It contains figurative elements, embedded in a solid, yellowish substance called plasma
C. It carries metabolic products from the cells to the kidney
D. It is more viscous than water and its normal pH ranges between 7.35 – 7.45
E. Its major components are represented by plasma and figurative elements

2. Choose the true statement(s) referring to the functions of blood:
A. Its white cells (leukocytes) contribute to the body's protection against infections
B. It transports metabolic products and hormones
C. It does not transport hormones, as these are carried only by lymph
D. It transports nutrients from the digestive tract to the cells
E. It transports respiratory gases, oxygen and carbon monoxide

3. Choose the true statement(s) referring to whole blood:
A. Its two major components are: plasma and figurative elements
B. Its components are represented by plasm, blood cells (erythrocytes and leukocytes) and platelets
C. The greatest part of its figurative elements is represented by erythrocytes or red blood cells
D. The smallest part of its figurative elements is represented by erythrocytes or red blood cells
E. The greatest part of figurative cells is represented by thrombocytes or platelets

4. Blood contains the following elements:
A. Figurative elements embedded in blood serum, a yellowish watery fluid
B. Blood plasma which contains water and several dissolved substances
C. Red blood cells or erythrocytes
D. White cells (leukocytes) and platelets (fragments from the cytoplasm of megakaryocytes)
E. Fragments from the nucleus of megakaryocytes

5. The following are functions of blood, *with the exception of*:
A. Oxygen transport from cells to the lungs
B. Ensuring the body's immunity via its white cells
C. The transport of hormones from target cells to the originating endocrine gland
D. The transport of nutrients from the digestive system to the cells of the body
E. Serum coagulation due to the fibrinogen it contains

6. Blood consists of the following elements:
A. Figurative elements, up to 45%
B. Water, up to 99%
C. Three types of plasma proteins (albumins, globulins, haemoglobin)
D. Various ions (sodium, potassium, calcium, chloride, bicarbonate
E. Proteins that have a role in coagulation (fibrinogen)

7. Serum contains:
A. Albumins and globulins (proteins)
B. Globulins and haemoglobin (proteins)
C. Fibrinogen (protein involved in blood coagulation)
D. Lipids (cholesterol, triglycerides)
E. Glycogen (polysaccharide)

8. The following statement(s) is/are true about albumins:
A. They maintain the blood's hydrostatic pressure
B. They contribute to blood viscosity
C. They are partly responsible for maintaining a certain blood pH

D. They transport enzymes
E. They transport certain substances (hormones, certain lipids)

9. The following statement(s) is/are true about globulins:
A. They represent 7% of plasma proteins
B. All globulins are synthesized by the immune system
C. Gammaglobulins are antibody molecules
D. Alpha and beta globulins are plasma proteins which transport hormones, vitamins, fatty acids
E. Gammaglobulins enter into specific combinations with the substances which stimulated their formation (antigens)

10. The following statement(s) is/are true about plasma and its composition:
A. It does not contain glucose and amino acids
B. It contains lipids, glucose, amino acids and other metabolites (nitrogen-containing products)
C. It contains positive ions (sulphate, bicarbonate) and negative ions (chloride, acid phosphate)
D. It contains 1% ions (Na^+, K^+, Ca^{2+} etc.)
E. It contains dissolved gases (O_2 – approximately 2% of the quantity transported by blood and CO_2 – approximately 7% of the total CO_2 transported by blood)

11. Choose the true statement(s) referring to the blood's figurative elements:
A. There are three types of figurative elements: red blood cells (erythrocytes), leukocytes (platelets) and thrombocytes (white cells)
B. Neutrophils and basophils are leukocytes belonging to the class of granulocytes
C. Eosinophils and platelets are white blood cells
D. Red blood cells are also called erythrocytes
E. Lymphocytes and monocytes are agranulocytes and belong to leukocytes

12. Choose the true statement(s) referring to the blood's figurative elements:
A. They are represented by red blood cells, leukocytes and thrombocytes
B. Eosinophils and basophils belong to blood platelets
C. They male up 45% of the whole blood
D. Leukocytes include: neutrophils, eosinophils, erythrocytes, lymphocytes
E. Leukocytes include: monocytes, basophils, neutrophils, lymphocytes

13. Choose the correct associations referring to blood's figurative elements:
A. Thrombocytes – blood platelets – fragments from the cytoplasm of megakaryocytes
B. Leukocytes – white cells – protection against infection
C. Lymphocytes – white cells – oxygen transportation
D. Basophils – white cells – possible role in the allergic response
E. Erythrocytes – red blood cells - O_2 transport – CO_2 transport

14. Choose the true statement(s) referring to erythrocytes (red blood cells):
A. They contain haemoglobin, consisting of four polypeptide chains, each associated to a heme group
B. They contain haemoglobin, with the molecule consisting of four polypeptide chains, each associated to a heme group
C. Circulate in the blood for about 120 days, being subsequently phagocytized and destroyed by macrophages
D. They move in the bloodstream by diapedesis and contribute to anti-microbial defence
E. They are formed by erythropoiesis - a complex process which starts in the stem cell (hemocytoblast)

15. The following statement(s) is/are true about haemoglobin:
A. It is a plasma protein, synthesized in the liver
B. Contains 4 polypeptide chains: two called alpha and two called beta
C. Each of the polysaccharide chains of haemoglobin is attached to a heme group
D. Each haemoglobin molecule can transport a single oxygen atom
E. Each haemoglobin molecule can transport four oxygen molecules (O_2)

16. The following statement(s) is/are true referring to carbon monoxide:
A. It is a toxic gas whose molecules are transported in the form of carbaminohaemoglobin
B. It binds rapidly to iron ions in the heme groups forming a strong bond
C. It combines slowly to haemoglobin forming a weak link
D. When binding to haemoglobin, it takes up the space allotted to carbon dioxide
E. When binding to haemoglobin it takes up the space allotted to oxygen, with potentially lethal results

17. Choose the correct statement(s) referring to haemoglobin metabolising:
A. The iron released from haemoglobin is transported to the spinal bone marrow where it contributes to new haemoglobin synthesis
B. After the release of iron, the heme is initially transformed into biliverdin
C. Biliverdin is subsequently converted into bilirubin which will be transported from the liver to the spleen and will be excreted into the bile
D. By means of the bile, bilirubin is transported into the bowel and is subjected to the action of intestinal flora
E. Under the action of the intestinal bacterial flora, part of the bilirubin is converted into urobilinogen

18. The structure of the erythrocyte membrane may contain:
A. Lipid molecules, with antigen role
B. Protein molecules, called antigens
C. A series of molecules acting as antibodies (anti-A, anti-B)
D. Antigen A, antigen B, antigen Rh
E. Antibodies, the most important being anti-Rh

19. Choose the correct statement(s) from below:
A. Blood group A has antingen A on the erythrocyte and anti-B antibodies in the serum
B. Blood group B has antingen B on the erythrocyte and anti-A antibodies in the serum
C. Blood group AB has both A and B antigens on the erythrocyte and no antibodies in the serum
D. Antigen Rh, just like the other antigens, has multiple physiological functions in the body
E. The type of antigen (antigens) on the surface of the erythrocytes is the one that determines the blood group

20. Choose the correct statement(s) referring to a person's blood group:
A. Antigen A on the erythrocyte surface and anti-A antibodies in the serum – blood group A
B. Anti-B antibodies in the serum and antigen A on the erythrocyte surface – blood group A
C. Antigen B on the erythrocyte surface and anti-B antibodies in the serum – blood group B
D. Anti-A antibodies in the serum and antigen B on the erythrocyte surface – blood group B
E. Antigen B on the erythrocyte surface and anti-B antibodies in the serum – blood group AB

21. Choose the correct statement(s) referring to blood group 0:
A. It has both types of antigen, A and B, on the erythrocyte membrane
B. It has both types of antibodies, anti-A and anti-B, in the serum
C. Can receive blood from blood group A
D. Can donate blood to the blood group A
E. Can donate blood to the blood group B

22. Choose the correct statement(s) referring to blood group A:
A. It has A antigens on the erythrocyte surface
B. It has anti-A antibodies in the serum
C. It has anti-B antibodies in the serum
D. Can donate blood to blood group B
E. Can donate blood to blood group AB

23. Choose the correct statement(s) referring to blood group B:
A. It has B antigen in the serum
B. It has B antigen on the erythrocyte surface
C. Can donate blood to blood group 0
D. Can donate blood to blood group B
E. Has anti-A antibodies in the serum

24. Choose the correct statement(s) referring to blood group AB:
A. It has antigens A and B on the erythrocyte surface
B. It has anti-A and anti-B antibodies in the serum
C. It can receive blood from blood groups A and B
D. It cannot receive blood from blood group A
E. It can receive blood from blood group 0

25. Blood group AB, Rh- can receive blood from:
A. Blood group 0, negative Rh
B. Blood group A, negative Rh
C. Blood group B, positive Rh
D. Blood group AB, positive Rh
E. All blood groups with negative Rh

26. Choose the rules that have to be observed in emergency cases that require blood transfusion:
A. Same-type antigens and antibodies should not meet in the recipient's blood
B. Knowing the blood group of the donor and of the recipient is mandatory
C. A 0-group recipient can receive blood from all blood groups
D. A 0-group donor can donate blood to all the other blood groups
E. An AB-group recipient can receive blood from groups A and B

27. White blood cells or leukocytes:
A. Their primary role is to protect tissues against infections and foreign substances in the body
B. They have a nucleus which can have two or more lobes or can have different sizes and shapes
C. They are anucleated, just like erythrocytes
D. They have cellular organelles, but they don't have a nucleus
E. Enter the blood stream by diapedesis and leave the blood stream in the same way

28. Choose the correct statement(s) referring to leukocytes:
A. Depending on the presence of cytoplasmic granules, they can be classified into granulocytes and agranulocytes
B. Depending on their type, they can remain in the blood stream for a few hours up to a few months
C. Lymphocytes are an example of granulocytes
D. They migrate from the blood into the tissues by cytolysis
E. Neutrophils belong to granulocytes

29. Choose the correct statement(s) referring to leukocytes:
A. They migrate from the blood into the tissues by diapedesis
B. Granulocytes are represented by lymphocytes and monocytes
C. Agranulocytes are devoid of nucleus and of granules
D. Once in the bloodstream, certain types of leukocytes finish their maturation process in the thymus (T lymphocytes)
E. Neutrophils, eosinophils and basophils contain granules in their cytoplasm (they are granulocytes)

30. Choose the correct statement(s) referring to lymphocytes:
A. They represent about 30% of the total number of leukocytes and they are of two types, B lymphocytes and T lymphocytes
B. Both lymphocyte types can be found in the lymph nodes and in the blood
C. T lymphocytes maturate in the thymus and after their contact with an antigen they turn into antibody-producing plasmocytes
D. B lymphocytes, stimulated by the body's antigens during the immune response, proliferate and turn into plasmocytes
E. Migrate to the site of infection through diapedesis and turn into macrophages

31. Choose the correct statement(s) referring to thrombocytes:
A. Also called blood platelets, they are anucleated cells
B. They are formed in the red bone marrow from megakaryocytes
C. They are derived from the same precursor as red blood cells, called erythroblast

D. Their approximate number is of 300000/mm^3 blood
E. They are involved in haemostasis by forming platelet aggregation

32. Choose the correct statement(s) about the heart and the cardiovascular system:
A. The heart is responsible for the transport of respiratory gases in dissolved form
B. The cardiovascular system consists of the heart and blood vessels
C. The cardiovascular system includes a set of tubes which transport blood (blood vessels)
D. The heart is the organ which acts like a pump in the cardiovascular system
E. The cardiovascular system actually supplies only certain regions of the body

33. Choose the correct statement(s) about the heart:
A. It is situated in the mediastinum, in the thoracic cavity
B. It is bordered by the lungs, which overlap on it
C. It is a two-cavity organ (an atrium and an auricle)
D. It is a four-cavity organ (two atria and two ventricles)
E. It lies posterior to the spinal column and anterior to the sternum

34. Choose the correct statement(s) about the atria:
A. They are two cavities, situated superior to the ventricles
B. Both have a flat, wrinkly, projection called atrial appendage or auricle
C. The left atrium receives blood from the superior vena cava
D. The right atrium receives blood from the lungs, via the pulmonary veins
E. They are cavities which serve to fill the heart with blood

35. Choose the correct statement(s) about the ventricles:
A. There are two ventricles situated inferior to the atria
B. Each ventricle has an auricle which enhances its capacity
C. They are heart cavities acting as a pump
D. The left ventricle pumps oxygenated blood into the aorta
E. The right ventricle receives the blood from the pulmonary veins

36. The following statement(s) is/are true about systemic circulation:
A. It begins in the left heart
B. The left ventricle receives, through the bicuspid valve, oxygenated blood from the left atrium
C. Oxygenated blood returns to the heart by the venae cavae
D. The arteries of the systemic circulation take the blood to the head, thorax, abdominal region and other parts of the body
E. Oxygenated blood returns to the left atrium by the pulmonary veins

37. Choose the correct statement(s) about the heart valves:
A. They ensure the unidirectional flow of the blood, preventing its reflux
B. There are six heart valves (three atrioventricular ad three semilunar)
C. Two of the heart valves are called atrioventricular valves, the other two being called semilunar valves
D. Atrioventricular valves let blood flow from the atria into the ventricles, preventing it to return into the atria when the ventricles contract
E. The two semilunar valves are situated at the point of origin of the two main arteries (coronary arteries) in the ventricles

38. The following statement(s) is/are true about the sinoatrial (SA) node:
A. It represents a mass of cardiac muscle cells and is situated in the superior wall of the right atrium
B. It represents a mass of cardiac muscle cells and is situated in the superior wall of the left atrium
C. It is characterised by auto-rhythmicity thus determining the rhythm of cardiac contractions (pacemaker)
D. It is situated in the interatrial septum
E. It depolarizes without nerve involvement approximately 70-80 times/minute

39. The following statement(s) is/are true about electrocardiogram (ECG):
A. It records the transmission of the nerve impulse through the heart's cardiac conduction system
B. It is also called encephalogram and records the contraction of the myocardium through the heart's cardiac conduction system
C. A normal ECG recording shows the following succession: T wave, QRS complex and P wave, which appear in one of every three cardiac cycles
D. A normal ECG recording shows the following succession: P wave, QRS complex and T wave, which appear in every cardiac cycle
E. The P wave shows atrial depolarisation

40. A normal electrocardiogram shows the following waves:
A. Atrial depolarisation wave – ascending wave – P wave
B. Atrial repolarisation wave – descending wave – P wave
C. Ventricular depolarisation complex – QRS complex
D. Ventricular repolarisation complex – QRS complex
E. Ventricular repolarisation wave – rounded deflection – T wave

41. The following statement(s) is/are true about the cardiac cycle:
A. It represents the succession of contractions, without intercalated relaxation, of the heart cavities
B. The term „systole" refers to the heart's contractions
C. The term „systole" refers to the heart's relaxation periods
D. The term „diastole" refers to the heart's relaxation periods
E. Consists of systole and diastole

42. Choose the correct statement(s) about blood vessels:
A. They form a network of tubes which transport blood from the heart to the body's tissues and back
B. The vessels that transport blood to the tissues are called veins
C. Veins result from the union of venules (small veins) and carry blood back to the heart
D. Capillaries leave the cellular environment and form arterioles
E. Arteries are divided into small vessels called arterioles and the latter are subdivided into capillaries

43. Choose the correct statement(s) about arteries:
A. They are vessels that carry high-pressure blood from the heart to the arterioles
B. They have a three-layered thick and tough wall
C. They have an external tunic consisting of a simple pavement epithelium, called endothelium
D. They have the property to expand due to the fibrous connective tissue
E. They have an empty central space, called lumen

44. Choose the correct statement(s) about capillaries:
A. Their function is to facilitate the exchange between blood and tissues
B. In the capillaries, the exchange of nutrients and gases takes place exclusively in certain tissues
C. The passage of blood into the capillary bed is regulated by the precapillary sphincter
D. The exchanges between blood and cells in the body take place in a transendothelial manner according to Starling's law of fluid movements
E. Capillary walls have several layers of endothelial cells and smooth muscle fibres

45. Veins have the following functions:
A. They carry low-pressure blood from the venules to the heart
B. Facilitate the exchange of nutrients and respiratory gases between cells
C. Control blood circulation in the capillaries by vasoconstriction or vasodilation
D. Hold approximately 60% of the blood volume (they act as the body's blood reservoirs)
E. Connect arterioles with venules in systemic circulation

46. Choose the correct statement(s) about the pulse:
A. It represents a pressure wave in the arteries, due to the contractions of the left ventricle
B. It is normally measured at the radial artery at wrist level

C. It can be measured at all the branches of the carotid artery
D. It has the same rate as the heart rate, an average of 70 – 75 beats/minute
E. Pulse becomes stronger as the blood gets farther from the heart

47. Choose the correct statement(s) about the regulation of the blood flow:
A. It can be coordinated by the regulating centres in the encephalon or other areas of the nervous system
B. It is not influenced by chemical substances in the body, regardless of their concentration
C. It is coordinated by the vasomotor centre in the medulla oblongata
D. It is the result of voluntary impulses generated by the somatic nervous system
E. It can also be carried out by baroreceptors which are indirectly involved by vasoconstriction or vasodilation

48. The following arteries contribute to the vascularisation of the limbs:
A. The right axillary artery (for the right upper limb)
B. The brachial, radial and ulnar arteries (for the arm and forearm)
C. The superficial palmar arch (for the forearm)
D. The external iliac artery, a branch of the femoral artery (for the lower limb)
E. The femoral, popliteal, anterior tibial, posterior tibial and the dorsal arch (for the lower limb)

49. Choose the correct statement(s) about the portal hepatic system:
A. It carries blood from the gastrointestinal tract and spleen to the liver
B. Hepatic portal circulation takes place in two opposite directions
C. It carries nutrients to the liver in order to be processed, the main vessel being the portal vein
D. It carries low-oxygen blood as it has supplied the gastrointestinal tract
E. After passing through the liver, the blood leaves it through the hepatic arteries, branches of the coeliac trunk

50. The following statement(s) is/are true about the veins that drain organs in the abdominopelvic cavity:
A. The superior rectal veins and the sigmoid vein drain into the inferior mesenteric vein
B. The appendicular vein collects blood from the appendix and drains it into the inferior mesenteric vein
C. The jejunal, ileal, ileocolic and right colic veins drain into the superior mesenteric vein, and the latter drains into the portal vein
D. The portal vein receives blood from the splenic vein, the inferior mesenteric vein, the superior mesenteric vein and the gastric vein
E. The two hepatic veins, right and left, enter the liver and join the inferior vena cava

CHAPTER 8 ▸ The respiratory system. The urinary system

1. Choose the correct statement(s) referring to the respiratory system:
A. It carries oxygen and carbon dioxide between the cells of the body and the body's internal environment
B. It comprises several organs whose function is to transport air to and from the lungs
C. It contains a conducting zone consisting of a series of branching tubes which form the airways
D. It is responsible with providing oxygen and nutrients to the tissues
E. It is responsible with eliminating metabolic products from the tissues

2. The following statement(s) is/are true about the airways:
A. The bronchi are the smallest branches of the airways
B. The smallest branches of the respiratory zone end in areolae
C. The smallest branches of the respiratory system airways end in alveoli
D. The smallest branches of the respiratory system conducting zone end in alveoli
E. The airways include, in descending order, the bronchi, the bronchioles, the trachea and the larynx

3. The following statement(s) is/are true about the gas exchange in the respiratory system:
A. It takes place in the airways, between the bronchi and the bronchioles
B. It takes place in the alveoli (microscopic air sacs)
C. It takes place in the alveoli which provide a large exchange surface
D. It takes place in the alveoli which consist of the visceral pleura membrane and are covered with an extensive capillary network
E. It takes place in the alveoli consisting of thin membranes, covered with the extensive capillary network of the pulmonary circulation

4. The following statement is *wrong* about the gas exchange in the respiratory system:
A. It takes place in the pulmonary alveoli
B. Blood containing a large amount of carbon dioxide and low in oxygen enters the lungs through the pulmonary arteries
C. The blood that exits the lungs via the pulmonary veins has a low concentration of carbon dioxide
D. The blood that exits the lungs via the pulmonary arteries is rich in oxygen
E. The blood that exits the lungs via the pulmonary veins has a high concentration of oxygen

5. Choose the correct associations referring to the gas exchange in the lungs:
A. The blood in pulmonary veins – high O_2 – low CO_2
B. Alveoli – sacs – small surface for O_2 exchange
C. Alveoli – thin-walled sacs – large exchange surface
D. The blood in pulmonary arteries – high CO_2 – low O_2
E. Gas exchange – diffusion – active transport (against the pressure gradient)

6. The following statement(s) referring to the nose is/are true:
A. It belongs to the conducting zone of the respiratory system
B. It has an external part consisting of cartilage and skin
C. It is adapted to filter, cool and dry air
D. It has two internal parts called nasal cavities
E. It represents the normal entry way of air in the respiratory system

7. Choose the correct statement(s) referring to the nose and the nasal cavities:
A. The nasal choanae enable the communication between the nasal cavities and the nasopharynx
B. The nose is responsible for heating, humidifying and filtering air
C. Part of the nasal mucosa in the inferior wall of the nasal cavities forms the olfactory region
D. The external nares (nostrils) are openings of the nasal cavities to the external environment
E. From the nasal cavity, air is carried straight to the larynx

8. The following statement(s) referring to the nasal cavities is/are true:
A. They represent the internal part of the nose
B. They communicate with the external environment through the nostrils
C. They are also associated with the sense of taste
D. They are subdivided into airways through the superior, middle and inferior sphenoid conchae
E. They are lined by a mucosa whose inflammation is called rhinitis

9. A sagittal section which displays the structures of the human nose reveals the following after the removal of the nasal septum:
A. The frontal sinus inside the bone bearing the same name
B. The sphenoid sinus, superior to the sella turcica of the sphenoid bone
C. The superior nasal concha which delimits the middle meatus
D. The inferior nasal concha which delimits the inferior meatus
E. The nasal vestibule, in the ventral part of the nasal cavity

10. Choose the correct statement(s) referring to the nasal mucosa:
A. It lines the external part of the nose
B. It forms the olfactory region in the inferior wall of the nasal cavity
C. It contains blood vessels which warm cold air
D. It secretes mucus which humidifies dry air
E. It has ciliary cells which carry microorganism-contaminated mucus to the nostrils where it is eliminated

11. Choose the true statement(s) referring to sinuses:
A. They are empty spaces situated in the bones of the cranium (frontal, maxillary, sphenoid and occipital)
B. They open into the nasal cavities
C. They decrease the weight of the cranium and serve as resonance chambers
D. They are areas where air is cooled and slowed down
E. They are lined with a mucosa which continues the mucosa of the nasal cavity

12. Choose the correct answers from below:
A. The nasal cavity is associated with the olfactory sense
B. The part of the mucosa lining the nasal cavities, responsible for the sense of smell, forms the respiratory area
C. The olfactory region is situated in the upper wall of the nasal cavities
D. The nose is not adapted to warm up air, only to cool it down
E. The blood vessels in the nasal mucosa warm up cold air

13. The pharynx has three parts:
A. The nasopharynx, located posterior to the nasal cavities and inferior to the palate veil
B. The oropharynx, situated posterior to the oral cavity
C. The oropharynx where the digestive and respiratory tracts meet
D. The laryngopharynx, situated posterior to the larynx
E. The nasopharynx, situated posterior to the nasal cavities

14. Choose the true statement(s) referring to the larynx:
A. It belongs to the airways and it has a cartilaginous structure
B. It is the passageway of food to the oesophagus
C. It is a passageway of air from the pharynx to the trachea
D. It can be described as having cartilaginous structures arranged similarly to a sphere
E. It is involved in the production of sounds

15. The following statement(s) referring to the larynx is/are true:
A. It is involved in the production of sounds
B. It has a cartilaginous structure, containing the thyroid cartilage, the epiglottis, the glottis and the cricoid cartilage
C. It joins the pharynx and the trachea at the level of the cervical vertebrae
D. It houses the vocal cords
E. It extends from the nasal cavities to the trachea

16. Choose the correct associations:
A. Larynx – thyroid cartilage – signet ring
B. Larynx – shorter vocal cords – children
C. Larynx – women – higher-pitched voice
D. Larynx – thyroid cartilage – posterior of the neck
E. Larynx – thyroid cartilage – more visible in men

17. Choose the correct statement(s) referring to the trachea:
A. It is a semi-rigid tube, approximately10 – 12 millimetre long
B. It branches in two main bronchi
C. It continues the larynx
D. It is lined with ciliary cells which filter air before it enters the bronchi
E. It is a passageway for air and it houses the vocal cords

18. The following statement(s) referring to the larynx and the trachea is/are true:
A. They belong to the airways, the larynx being inferior to the trachea
B. They belong to the conducting zone of the respiratory system, together with the pharynx, bronchi and bronchioles
C. The larynx continues with the trachea. A semi-rigid tube
D. The larynx has C-shaped cartilaginous rings and the trachea has circular rings
E. The mucosa lining the trachea contains ciliary cells which filter the air before it enters the bronchi

19. Choose the true statement(s) referring to the main (primary) bronchi:
A. They are kept open by some cartilaginous rings situated in the posterior part
B. They belong to the bronchial tree
C. The main left bronchus is wider and more horizontal than the right bronchus
D. There are three bronchi in the right lung and two in the left lung
E. They result from the branching of the trachea

20. The following statement(s) referring to the pulmonary alveoli is/are true:
A. They are microscopic air sacs, approximately 300 million for each lung
B. They are the site where pulmonary gas exchange takes place (O_2 is eliminated and exchanged for CO_2)
C. In the alveoli, O_2 from the air is exchanged for CO_2 from the blood by a passive diffusion process
D. The respiratory membrane of alveoli forms an extremely thin barrier which allows the passage of respiratory gases
E. The alveoli receive oxygenated blood from a branch of the pulmonary artery

21. Choose the correct statement(s) referring to the anatomy of the respiratory system:
A. The nasal cavities, the larynx and the trachea belong to the airways and they are lined with mucosa
B. The branches of the trachea, bronchi and bronchioles form the bronchial tree of the lung
C. The larynx lies in the inferior part of the trachea
D. The larynx has true vocal cords and false vocal cords (ventricular folds)
E. Sinuses (mucosa-lined cavities) can be found in the frontal, sphenoid, occipital and maxillary bones

22. Pulmonary ventilation:
A. Is based on the principle according to which air travels from a low-pressure area to a high-pressure area
B. Is based on the principle according to which air travels from a high-pressure area (high density) to a low-pressure area (low density)
C. Is the process by which air flows in and out of the alveoli
D. Belongs to the breathing process, together with gas exchange
E. Represents the gas exchange between alveoli and blood

23. The decrease of hydrogen ion concentration in the cerebrospinal fluid:
A. Activates the respiratory control centre
B. Inhibits the activation of the respiratory control centre
C. Determines the increase of the respiratory rate and amplitude

D. Determines the decrease of the respiratory rate and amplitude
E. Is the result of increased carbon dioxide concentration in the cerebrospinal fluid

24. In the lungs:
A. Oxygen passes from the alveoli into the bloodstream, to be transported to the cells
B. Oxygen passes from the bloodstream into the alveoli, to be expelled by breathing
C. Carbon dioxide passes from the alveoli into the bloodstream
D. Carbon dioxide passes from the bloodstream to the alveoli, to be expelled by breathing
E. Both oxygen and carbon dioxide can move bilaterally between the bloodstream and alveoli

25. The following statement(s) referring to the blood vessels of the lungs is/are true:
A. Pulmonary arteries, which enter both lungs, come from the pulmonary trunk that originates in the left ventricle
B. The lungs receive oxygenated blood through the pulmonary arteries
C. The pulmonary arteries are the only arteries which carry deoxygenated blood
D. The capillaries originating in the pulmonary artery form the capillary bed that surrounds the alveoli
E. After the gas exchange between the bloodstream and the alveolar air, capillaries join together to form the pulmonary veins which exit the lungs

26. The urinary system consists of:
A. Two kidneys, situated retroperitoneal in the abdominal cavity
B. Two kidneys, situated in the pelvic cavity
C. Accessory organs (ureters, urinary bladder, urethra)
D. The adrenal glands
E. The urethra (a tube that is responsible for eliminating urine from the bladder during micturition)

27. The following statement(s) referring to the kidneys is/are true:
A. They are hollow organs located in the abdominal cavity
B. They are located on the posterior abdominal wall
C. They are located on the anterior abdominal wall
D. They lie retroperitoneally (behind the peritoneum)
E. They lie intraperitoneally (behind the peritoneum)

28. Choose the correct statement(s) referring to the kidneys:
A. There are two kidneys, situated retroperitoneally
B. They lie laterally to the spinal column
C. They lie medially to the spinal column
D. Superiorly, they are in contact with the adrenal glands
E. They are supported by fatty and connective tissue

29. In relation to the diaphragm, the kidneys lie:
A. Superior to the diaphragm, in the abdominal cavity
B. Inferior to the diaphragm, in the abdominal cavity
C. The upper extremity is higher (close to the diaphragm), in the left kidney
D. The upper extremity is higher (close to the diaphragm), in the right kidney
E. The upper extremity is higher (close to the diaphragm), in both kidneys

30. Choose the correct statement(s) referring to the kidneys:
A. The upper extremity of the left kidney is higher than the upper extremity of the right kidney
B. Their lower extremity borders on the adrenal glands
C. Their inside is lined with a fibrous tissue capsule
D. Their anterior surface has a recessed area called renal hilum
E. Their medial surface has a concave area called renal hilum

31. The kidneys consist of the following structures:
A. Two distinct areas, cortical and medullary

B. The renal cortex, inside the kidney
C. The renal medulla, at the periphery of the kidney
D. A deep area, the renal medulla, represented by the renal pyramids
E. An external area, called cortex, containing renal glomeruli, parts of the nephron tubules and blood vessels

32. Choose the true statement(s) referring to the cortical area of the kidney:
A. It is represented by the major and the minor calyces
B. It contains the renal pyramids
C. It contains the renal glomeruli and Bowman's capsule, the afferent and the efferent arteriole and parts of the nephron tubules
D. It does not contain the loop of Henle
E. It is situated at the periphery of the kidney and sends projections to the renal medulla

33. Choose the true statement(s) referring to the renal medulla:
A. It is represented by the collecting ducts and the ureters
B. It contains several triangular masses, the renal pyramids
C. It contains renal pyramids delimited by renal columns
D. It contains certain parts from the nephron structure (the loop of Henle) and the peritubular capillaries
E. It is situated in the peripheral area of the renal parenchyma

34. The nephron consists of the following structures:
A. The glomerulus, a capillary network resulting from the branching of the afferent arteriole
B. The glomerular capsule, a macroscopic network of capillaries
C. The glomerulus, capillary network which join together forming the efferent arteriole
D. The proximal convoluted tubule and the distal convoluted tubule
E. The collecting duct, which collects urine from a single nephron

35. Identify the correct statement(s) referring to the blood vessels of the nephron:
A. The afferent arteriole takes blood from the renal artery to the glomerulus
B. The afferent, microscopic, arterioles form the glomerular capillary network
C. The glomerular capsule is surrounded by the peritubular capillary network
D. The efferent arterioles form the peritubular capillary network
E. The peritubular capillaries drain into small veins which join together to form eventually the renal vein

36. Choose the true statement(s) referring to the nephron tubules:
A. The proximal convoluted tubule continues the loop of Henle
B. The proximal convoluted tubule is situated in the renal cortex
C. The loop of Henle continues the proximal convoluted tubule and is U-shaped
D. The distal convoluted tubule continues Bowman's capsule
E. The distal convoluted tubule continues the ascending branch of the loop of Henle

37. Urine is formed in various parts of the nephron by:
A. Filtration (the passage of small-molecule dissolved substances from the glomerular capillaries to the glomerular capsule)
B. Reabsorption (the passage of water, salts and other substances from the tubule lumen into the peritubular capillaries)
C. Tubular secretion (the passage of certain substances from the blood of peritubular capillaries into the distal convoluted tubule)
D. Tubular filtration (from the peritubular capillaries into the tubule lumen)
E. Protein precipitation in Bowman's capsule, followed by water osmosis

38. The filtration process:
A. Recovers nutrients, salts and water from fluid of the proximal and distal tubules
B. Is represented by the passage of fluid from blood plasma into the glomerular capsule through submicroscopic apertures

C. It excretes the molecules from the peritubular capillaries into the nephron tubules
D. It pushes water and small plasma molecules out of the glomerular capillaries and into Bowman's capsule
E. It transports urine to the ureters, and from there to the bladder, the urethra and out of the body

39. The proximal convoluted tubule:
A. Its wall contains millions of microvilli which considerably enlarge the contact surface with the contents of the lumen
B. Glomerular filtrate arrives here and then leaves the glomerular capsule
C. Hosts the reabsorption process of certain ions
D. Glomerular filtrate arrives here after having passed through the loop of Henle
E. Is the site of tubular secretion processes

40. Glucose and amino acid reabsorption takes place:
A. In the proximal convoluted tubule
B. In the distal convoluted tubule by osmosis
C. By passive transport (with ATP uptake)
D. By active transport (with ATP uptake)
E. In the loop of Henle (isosmotic)

41. The following processes take place in the loop of Henle:
A. Glomerular filtrate from the ascending branch of the loop enters the proximal convoluted tubule (after the selective reabsorption in the proximal tubule)
B. Glomerular filtrate from the proximal convoluted tubule enters the descending branch of the loop (after the selective reabsorption in the proximal tubule)
C. Na^+ and Cl^- pass into the medullary interstitium in the ascending branch, where the fluid in the tubule flows
D. Total reabsorption of water, sodium and chloride
E. The reabsorption by active transport of water, sodium and chloride

42. Choose the true statement(s) referring to the ascending branch of the loop of Henle:
A. No water reabsorption takes place in it (or only very small amounts)
B. It is very permeable to water which is reabsorbed through the countercurrent mechanism
C. It enables sodium and chloride ion reabsorption
D. It ascends from the medulla back to the cortex
E. It is the place where sodium and chloride ions enter from the medullary interstitium

43. The following processes take place in the distal convoluted tubules:
A. The selective reabsorption of ions by active transport
B. The reabsorption of water under the influence of ADH
C. Glucose and potassium secretion
D. Secretion of certain medicines and certain hormones
E. Filtration of blood plasma

44. The process of tubular secretion:
A. Takes place in the nephron tubules (especially in the distal convoluted tubule) and in the collecting ducts
B. Is a passive process which transports chemical compounds from the tubular fluid into the bloodstream
C. Is an active process which transports chemical compounds from the bloodstream into the tubular fluid
D. Mainly takes place in the proximal convoluted tubules and in the glomerular capsule
E. Transports certain chemical compounds from the peritubular capillaries into the tubular fluid

45. Choose the correct statement(s) referring to the functional aspects of the nephron:
A. The glomerulus and the glomerular capsule are responsible with filtering blood plasma
B. Glucose and amino acid reabsorption takes place in the proximal tubules
C. Water reabsorption by active transport takes place in the proximal tubules
D. The secretion of certain medicines takes place in the distal tubules
E. Sodium is reabsorbed by active transport in the ascending branch of the loop of Henle

46. Choose the true statement(s) about aldosterone and its role in regulating renal function:
A. It is secreted by the cortex of the adrenal glands and mainly influences the nephron's distal convoluted tubule
B. It stimulates sodium ion reabsorption from the distal convoluted tubule
C. It stimulates water elimination and potassium reabsorption in the nephron's proximal tubules
D. It stimulates the secretion of blood potassium in the distal convoluted tubule fluid
E. The excessive secretion of the hormone is a characteristic of Addison's disease

47. Several substances can be found in urine, such as:
A. Ketone bodies, in high amounts in healthy persons and low amounts in persons with diabetes mellitus
B. Pigments, the most important being urobilinogen, produced by bilirubin in the bowel
C. Hormones and various medicines
D. Urea, resulting from lipid catabolism during the ornithine cycle
E. Urea, synthesized in the liver by amino acid metabolism and the use of their amino ($-NH_2$) groups

48. The following statement(s) is/are true about the ions found in urine:
A. Cations, negatively charged ions, are represented by chloride and phosphates
B. Cations are represented by sodium (Na^+) and potassium (K^{2+})
C. Potassium and sodium are monovalent cations
D. Calcium (Ca^{2+}) and magnesium (Mg^{2+}) belong to cations and are bivalent
E. Sulphate ion and chloride ion are anions

49. Choose the true statement(s) about the ureter:
A. Its inferior part opens in the urinary bladder
B. Its superior part continues the renal pelvis
C. It is a tubular organ where urine accumulates
D. It is a long tube which carry urine to the urinary bladder
E. It transports urine to the gallbladder through peristaltic waves

50. The following structures are accessories of the urinary system:
A. The ureter, a tubular organ
B. The urinary bladder, a distensible sac
C. The urinary bladder, situated anterior to the pubic symphysis
D. The urethra, whose external opening is the external urethral orifice
E. The convoluted seminiferous tubules in males

CHAPTER 9 ▸ The reproductive system

1. Choose the common characteristics of the male and female reproductive systems:
A. They produce reproductive cells called gametes
B. They contains ducts which receive and transport gametes
C. They contain glands and accessory organs which secrete fluids (subsequently carried through the ducts)
D. In the adult, for both genders, gonads are situated retroperitoneally
E. They include external genitalia (such as the vulva in women or the penis in men)

2. Choose the true statement(s) referring to the male reproductive system:
A. It is responsible for producing, storing, maintaining and transporting spermatozoa
B. It is responsible for producing, storing, maintaining and transporting male gametes
C. It does not include androgen-hormone producing cells (secreted only by the adrenal gland)
D. Have several structures similar to those of the female reproductive system: gonads, ducts, glands and accessory organs of the reproductive process
E. External genitalia are called gonads in men and vulva in women

3. Choose the true statement(s) referring to the male reproductive system:
A. Its reproductive cells are called gametes
B. Testicles are paired organs which secrete oestrogens and progesterone, but do not secrete testosterone
C. It is responsible for producing, storing, maintaining and transporting gametes
D. Testicles are also called male gametes or gonads
E. It consists of glands and accessory organs (the prostate, seminal vesicles)

4. Choose the true statement(s) referring to the male reproductive system:
A. It comprises gonads, ducts, glands and accessory organs
B. It comprises ducts, external genitalia, accessory organs and glands associated with the reproductive process
C. Testicles are not considered reproductive organs, but only endocrine organs
D. Testicles, also called male gonads, produce gametes and hormones
E. The external genitalia are considered accessory organs, not being associated with the reproductive process

5. Which of the following statements referring to the male reproductive system are true?
A. Its reproductive cells are called gametes, just like those of the female reproductive system
B. It is responsible for producing, storing, maintaining and transporting male reproductive cells
C. It has two pairs of gonads which produce gametes and hormones
D. The system has ducts which receive and transport reproductive cells
E. The system has accessory glands which secrete fluids that are transported through ducts

6. Choose the true statement(s) referring to the testicle:
A. It lies in the scrotum, a sac-like structure suspended under the perineum
B. It is a spherical organ, flattened superoinferiorly
C. It is an oval, flattened organ
D. Its function is to produce protein hormones, oestrogens and testosterone
E. Its function is to produce sex hormones (testosterone) and reproductive cells (spermatozoa)

7. Which of the following statements referring to the development of the testicles are true?
A. During the foetal phase, testicles develop in the abdominal cavity, near the kidney, and they descend to the scrotum until the 7^{th} month of pregnancy
B. The gubernaculum is a striated muscle tissue ligament, responsible for guiding the descent of the testis into the scrotum
C. Cryptorchidism is a disorder where testicles descend into the scrotum by the end of the 7^{th} month of pregnancy
D. Cryptorchidism may lead to infertility and requires surgical intervention
E. The temperature inside the abdominal cavity, a few degrees higher than that in the scrotum, prevents the normal process of spermatogenesis, which is why testicles need to descend in the scrotum

8. Choose the correct definitions from below:
A. Cryptorchidism – disorder where testicles are prevented from descending into the scrotum
B. The dartos – thin, smooth muscle situated in the superficial layers of the scrotal skin
C. The spermatic cord – a structure consisting of the ductus deferens, blood vessels and nerves
D. The inguinal canal – a passage that connects the compartments of the scrotum to the retroperitoneal space
E. The gubernaculum – a ligament of fibrous tissue, responsible with guiding the descent of the testicles into the scrotum

9. Choose the true statements:
A. The spermatic cord consists of blood vessels, nerves and the ductus deferens
B. The spermatic cord is the canal that crosses the peritoneum and connects the scrotum compartments to the peritoneal cavity
C. The area of the inguinal canal is a low-resistance point in the abdominal wall thus facilitating the development of inguinal hernias
D. The area of the inguinal canal is a high-resistance point in the abdominal wall and the peritoneum
E. Hernias represent the protrusion of any abdominal structure through the abdominal wall

10. Choose the true statements referring to the scrotum:
A. It is a structure with multistratified walls which houses the testicles
B. It is divided into two compartments separated by a thickened ridge
C. The two compartments are delimited by the perineal raphe
D. The deep layers of the scrotum wall contain the perineal raphe, a smooth, rather thick, muscle
E. The dartos muscle in the deep layers of the scrotum is the site of spermatogenesis

11. Choose the true statements referring to the seminiferous tubules:
A. They are located in the lobules of testis and are also called ductus deferentes
B. Their epithelium consists of germinal cells and interstitial cells
C. The germinal cells of the seminiferous tubules produce spermatozoa – the male sexual cells
D. The supporting cells of the seminiferous tubules produce testosterone
E. The interstitial cells located outside the seminiferous tubules secrete androgenic hormones (mainly testosterone)

12. Choose the true statements referring to the testicular network (rete testis):
A. It is a plexus resulting from interconnecting seminiferous (convoluted) tubules
B. It is drained by several afferent channels which originate in the superior part of the testes
C. It is drained by the efferent channels which subsequently enter the epididymis
D. It is drained by several efferent channels which originate in the inferior part of the testes
E. It is drained by several efferent channels which originate in the superior part of the testes

13. Choose the correct associations from below:
A. Testicle – oval shape – situated in the pelvis
B. Scrotum – two compartment – the dartos muscle
C. Scrotum – one compartment for each testicle – perineal raphe
D. Inguinal canal – high resistance point of the anterior abdominal wall – abdominal hernia
E. Inguinal canal – low resistance point of the anterior abdominal wall – inguinal hernia

14. Which of the following statements are true?
A. The secretion of the cells lining the epididymis does not influence the composition of the seminal fluid
B. The seminal fluid adapts its composition according to the secretions or the cells lining the epididymis
C. Degradation products of stored sperm give seminal fluid its basic pH
D. The pH of the seminal fluid is acid due to the degradation products of stored sperm
E. Spermatozoa gain mobility in the epididymis in approximately two weeks

15. The following statement(s) is/are true about the epididymis:
A. It is a duct of the male reproductive system which receives the contents of ductus deferens
B. It is the site of reabsorption for deteriorated spermatozoa and for residues
C. In it, spermatozoa become mobile in approximately two months

D. In it, spermatozoa become mobile in approximately two weeks
E. After leaving it, spermatozoa pass into the ductus deferens (vas deferens)

16. The following statement(s) is/are true about the accessory organs of the male reproductive system:
A. They consist of organs that secrete fluids necessary for urine formation
B. They are organs that participate in sperm transportation during copulation
C. The seminal vesicle is a paired organ and secretes prostaglandins (hormonal substances)
D. The prostate, also called prostate gland, is an unpaired organ which secretes an alkaline fluid
E. The prostate contains striated muscle fibres which support it and surround the urethra

17. Choose the true statements referring to spermatogenesis:
A. It is the process by which male gametes are produced
B. It takes place in the seminiferous tubules, in the internal layer of the germinal cells
C. It begins in the outermost layer of the germinal cells in the seminiferous tubules
D. It takes place in the supporting cells which are components of the straight seminiferous tubules
E. The cells resulting from this process are called spermatozoa

18. Choose the true statements referring to primary spermatocytes:
A. They result from the mitotic division of spermatogonia
B. They are diploid cells (2n), their nucleus containing 46 chromosomes per cell
C. They are haploid cells (n), their nucleus containing 23 chromosomes per cell
D. They are diploid cells (2n), their nucleus containing 23 chromosomes per cell
E. They develop in the convoluted seminiferous tubules and they are moved to the inner regions of the latter

19. Which of the following statements referring to spermatozoa are true?
A. They are diploid somatic cells
B. They result from the division of the stem cells that migrated to the haematogenous marrow
C. They are the result of the process of spermatogenesis
D. They are haploid cells developing in the interstitial cells of the convoluted seminiferous tubules
E. They are also called male reproductive cells or male gametes

20. Choose the true statements referring to the male gametes:
A. They are also called male sexual cells or spermatozoa
B. The complex process which produces them is called oogenesis
C. They develop in the lobules of testis, in the convoluted seminiferous tubules
D. The head, neck, middle piece and tail are parts of the spermatozoon
E. Sustentacular cells represent the site for spermatozoa synthesis in the testes

21. Choose the effects of testosterone:
A. It stimulates the metabolic processes that increase muscle mass
B. It controls the development of the male secondary sexual characteristics in the intrauterine period
C. It ensures the proper functioning of the male reproductive system after puberty
D. It inhibits the development of the male secondary sexual characteristics after puberty
E. It stimulates the development of male secondary sexual characteristics after puberty

22. Choose the true statements from below:
A. The follicle stimulating hormone FSH induces spermatogenesis
B. The follicle stimulating hormone FSH stimulates testosterone production
C. Testosterone induces spermatozoa maturation after puberty
D. In the foetus, testosterone contributes to the descent of the testes into the scrotum
E. Testosterone directly influences protein catabolism

23. Choose the true statements referring to testosterone and its effects:
A. It is a steroid hormone
B. It is produced in small amounts until puberty
C. In the foetus, it inhibits the descent of the testes into the scrotum
D. After puberty, it stimulates the metabolic processes connected to protein synthesis

E. It inhibits the increase of muscle mass

24. Which of the following statements are *false*?
A. The urethra runs from the urinary bladder to the tip of the penis and has three parts
B. Accessory organs such as seminal vesicles or bulbourethral glands secrete sperm-forming fluids
C. During erection, the prostate's erectile tissue fills with blood
D. The prostate secretes approximately 30% of the seminal fluid
E. The membranous urethra passes through the middle of the prostate and receives its secretions

25. About the ejaculate, it is true that:
A. It contains spermatozoa (20-100 million/ml semen)
B. Its volume is normally of 2-5 ml
C. It does not contain protease
D. It does not contain spermatozoa
E. It contains lubricating mucus, secreted by the bulbourethral glands

26. Choose the true statements referring to the female reproductive system:
A. It produces and stores the female reproductive cells
B. It transports female gametes
C. The gametes produced by the female reproductive system are diploid cells
D. It includes accessory glands and organs
E. It includes the reproductive organs – the ova – also called gonads

27. The female reproductive system includes:
A. The external genitalia (the vulva)
B. Ducts, which receive and transport gametes (fallopian tubes, the uterus, the vagina)
C. The bulbourethral glands and the accessory organs, which secrete the ova
D. Gonads, responsible for producing gametes
E. Ovaries, responsible for producing sex hormones

28. Referring to the functions of the female reproductive organs, which of the following statements are *false*?
A. The role of the ovaries is to produce ova (female gametes) and to secrete female sex hormones (oestrogens and progesterone)
B. The fallopian tubes are the site of fecundation
C. The vagina protects and sustains the foetus during its development
D. The labia minora delimit the vestibule and contain sebaceous glands
E. The vestibule is the area between the labia majora and includes the anal orifice (anus)

29. Which of the following are functions of the female reproductive system structures?
A. Production of ova – the function of the ovaries
B. Secretion of oestrogen hormones and progesterone – the function of the endometrium
C. The site of fecundation – the function of fallopian tubes
D. Elimination of endometrial mucosa during the menstrual period – the function of fallopian tubes
E. Sustaining and protecting the embryo and the foetus – the function of the uterus

30. Choose the true statements referring to the ovaries:
A. They are paired organs which produce ova
B. They secrete female sex hormones (progesterone and oestrogen)
C. They are situated in the abdominal cavity, intraperitoneally
D. They are small and almond-shaped
E. Also called gonads, they produce the egg cell or zygote, which will be expelled into the fallopian tubes

31. About the ovary, it is true that:
A. It is an unpaired, median, organ of about 5 cm long/2.5 cm wide
B. It is an unpaired, retroperitoneal, organ of about 5 cm long/2.5 cm wide
C. It is supported by a pair of ligaments (the ovarian ligament and the suspensory ligament)

D. It contains several groups of cells which form the white body (corpus albicans) responsible for producing female gametes
E. It has follicles containing maturating oocytes that will be released during ovulation

32. About the structure of the ovary, it is true that:
A. It includes the tunica albuginea, the ovarian cortex and the ovarian medulla
B. Ovarian follicles have several layers of cells which surround the immature primary oocyte
C. Before ovulation, the ovary contains a structure called corpus albicans
D. In the first 5 days after ovulation, the ovary develops a structure called corpus albicans
E. Approximately 14 days after ovulation, the ovary develops the white body, as a result of the regression of corpus luteum

33. Which of the following statement(s) represent(s) functions of the ovaries?
A. Nutrition and protection of the embryo
B. Secretion of a mucus that lubricates the vagina
C. The production of sex hormones by the corpus luteum
D. Nutrition and protection of the foetus during pregnancy
E. Production of female gametes by oogenesis

34. Referring to the uterus, which of the following statements are true?
A. It is a pear-shaped hollow organ, except during pregnancy when it shrinks considerably
B. It is situated medially, in the posterior part of the pelvic cavity, above the vagina and the urinary bladder
C. It is situated in the anterior part of the pelvic cavity, above the vagina and the urinary bladder
D. Its roles consist of ensuring the protection and the nutrients for the development of the embryo and the foetus
E. It is pear-shaped, except during pregnancy when it enlarges considerably

35. The following statement(s) is/are true about the component parts of the uterus:
A. Its upper part forms the body of the uterus
B. The upper part of the body of the uterus is called cervix
C. The inferior part of the uterus is called isthmus
D. The uterine cavity continues with the vagina, and the latter continues with the cervix
E. The cervical canal opens into the vagina through the external orifice of the cervix

36. Choose the correct statements from below:
A. Ovaries are located in a fold of the peritoneum, called ovarian ligament
B. The broad ligament of the uterus is a peritoneal fold which houses the most important organs of the female genital tract
C. Ovaries lie along the superior end of the broad ligament of the uterus
D. Fallopian tubes open into the pelvic cavity, lateral to the ovaries
E. The broad ligament of the uterus is attached to the lateral walls and the floor of the pelvic cavity

37. A fallopian tube has:
A. An infundibulum, situated near the ovary
B. An infundibulum, whose irregular and branching projections extend towards the uterus
C. An infundibulum and fimbriae – branching projections extending towards the ovary
D. The ampulla, which continues with the isthmus, towards the uterus
E. Smooth muscles whose peristaltic movements hinder the passage of the ovum through the tube

38. Which of the following statements referring to the vagina are true?
A. It is a fibromuscular canal that extends from the cervix to the vaginal opening in the vestibule
B. It has the property to distend and to extend superiorly and towards the anterior part of the pelvic cavity
C. The walls of the vagina contain a vast network of blood vessels and layers of striated muscles
D. The hymen is a thin fold of epithelium which partially or totally blocks the penetration of the vagina before intercourse
E. The only function of the vagina is to eliminate fluids during the menstrual period

39. Choose the correct associations referring to external female genitalia:
A. The vestibule – urethral orifice, situated anteriorly – vaginal opening, situated posteriorly
B. Labia minora – the extreme limits of the vulva – two folds containing sebaceous glands
C. Clitoris – prominence in the vagina – non-erectile tissue
D. Vestibular glands – Bartholin glands – lubricating secretions
E. Mons pubis – erectile tissue – anterior to the pubic symphysis

40. Which of the functions below are attributed the external female genitalia?
A. Bringing nutrients for the development of the embryo (the uterus)
B. Lubricating the vagina with glandular secretions (Bartholin glands, Skene glands)
C. Regenerating the endometrial functional layer after the menstrual period (basal layer of the endometrium)
D. Eliminating fluid during the menstrual period (the vagina)
E. Delimiting the vestibule which contains the urethral and the vaginal openings (labia minora)

41. The following statements are true referring to the mammary glands:
A. They are alveolar glands
B. They are situated in the posterior thoracic region, in the subcutaneous tissue of the breasts
C. They produce milk to feed newborns
D. Their lobes are drained by a connective-adipose tissue
E. They belong to the breasts and are situated in the anterior thoracic region

42. Choose the true statements referring to the menstrual cycle:
A. It consists exclusively of the structural alterations of the female reproductive system
B. It occurs as a response to the alterations in the blood levels of the hormones secreted by the ovary
C. It lasts approximately 28 days
D. Oogenesis occurs in the middle of the cycle
E. Ovulation normally occurs in the middle of the cycle

43. Choose the correct statements referring to the menstrual cycle:
A. The onset of the menstruation marks the beginning of a new menstrual cycle
B. The menstruation in a woman's life is called menarche
C. The first menstruation in a woman's life is called menarche
D. The permanent stop of menstrual cycles is called menopause
E. Ovulation occurs during the secretory phase of the menstrual cycle

44. Which of the following effects is induced by oestrogen hormones?
A. The stimulation of uterine contractions during birth
B. Inhibiting the development of female sexual characteristics
C. Stimulating the development of female sexual characteristics
D. Stimulating milk secretion in mammary glands
E. Milk ejection from the mammary glands during breastfeeding

45. Choose the correct statements from below:
A. The corpus luteum develops immediately after the menstrual phase of the menstrual cycle
B. In the vesicular follicle, the oocyte lies in a fluid-filled cavity, called antrum
C. Oxytocin is a steroid hormone, secreted by the neurohypophysis
D. If fecundation doesn't take place, the corpus luteum starts to degenerate
E. If fecundation occurs, the corpus luteum continues to secrete hormones

46. Choose the correct statements referring to fertilisation:
A. It represents the union of gametes during sexual reproduction
B. It usually occurs in the fallopian tubes, by the union of a spermatozoon with an ovum
C. It usually occurs in the uterine cavity, by the union of two spermatozoa with an ovum
D. The result of this process leads to the production of a fertilised ovum (zygote or egg-cell)
E. The result of this process leads to the production of the primary oocyte, also called an egg-cell

47. Choose the correct statements about the foetal membranes:
A. At the end of foetal development, the vitelline membrane develops, delimiting the amnion
B. During its development, the embryo is surrounded by several membranes
C. The chorion is the origin of the chorionic villi
D. The allantois is a part of the umbilical cord
E. The allantois is situated in the fallopian tubes, between the embryo and the vitelline sac

48. Which of the following associations are correct?
A. Ectoderm – nervous system – the epidermis and its accessories (nails, hair)
B. Mesoderm – excretory system – digestive tract mucosa
C. Mesoderm – circulatory system – skeleton – cardiac muscle
D. Endoderm – hypophysis – dermis – respiratory system
E. Endoderm – digestive tract mucosa – respiratory tract mucosa

49. Choose the correct associations about parturition:
A. The end of labour – an increase of prostaglandin secretion
B. The onset of labour – a decrease of progesterone secretion in the placenta
C. Oxytocin – stimulation of strong uterine contractions
D. Amnion rupture – preventing the release of amniotic fluid
E. Contractions of the abdominal wall – induced by uterine contractions via spinal cord reflexes

50. Choose the correct statements from below:
A. Also called parturition, childbirth occurs approximately 9 months after fertilisation
B. During the eighth month of pregnancy, the foetus has real chances of survival outside the mother's body
C. Most childbirths occur with pelvic presentation (the child's buttocks appear first)
D. Only 5% of childbirths occur with cranial presentation (the child's head appears first)
E. Placental expulsion from the uterus occurs a few minutes after childbirth

CHAPTER 10 ▸ The endocrine glands

1. Choose the true statements referring to the endocrine system:
A. It consists of endocrine glands whose products are released into the blood in order to maintain homeostasis
B. It consists of endocrine glands whose products are released into the lymph where they perform their function
C. It consists of all the glands whose products are released into the blood or into the lymph where they perform their function
D. It also comprises endocrine cells arranged diffusely in certain tissues
E. Blood transports hormones to the target cells, where they induce biochemical and physiological alterations

2. Choose the true statements referring to hormones:
A. They are transported by blood to the target cells where they perform their function (biochemical and physiological alterations)
B. In the target cells, they bind only to the receptors found inside the cell
C. Cortisol does not influence the growth and development of the body
D. Some of the hormones facilitate water and sodium retention in the body
E. They increase or decrease the level of blood glucose (the hormones secreted by the islets of Langerhans)

3. Choose the true statements referring to the secretory products of endocrine glands:
A. According to their chemical composition they are steroid hormones (steroids) and non-steroid hormones (non-steroids)
B. Adrenalin and insulin belong to steroid hormones
C. Cortisol, oestrogens and aldosterone are cholesterol-derived hormones
D. Non-steroid hormones have a ringlike, complex, lipid structure
E. Non-steroid hormones include protein hormones (consisting of amino acid chains, interconnected by peptide bonds)

4. The following statement(s) about hormones is/are true:
A. Steroid hormones are represented by ADH, oxytocin, insulin and prolactin
B. Peptide hormones are represented by ADH and oxytocin, while protein hormones by insulin, STH and prolactin
C. Some non-steroid hormones (noradrenalin and adrenalin) contain amine groups in their structure
D. Non-steroid hormones may also contain lipoproteins in their structure (VLDL, LDL and HDL)
E. Thyroxine and calcitonin are lipid hormones, being cholesterol-derived hormones

5. Choose the true statements referring to the mechanism of action of steroid hormones:
A. They cross easily the cell membrane, dissolving in phospholipids
B. Being highly hydrophilic, they need specific transport systems to penetrate the cell membrane
C. Being highly hydrophobic, they cannot penetrate the cell membrane and bind to the receptors on the cell surface
D. They combine with phospholipids in the cytoplasm of target cells, a phenomenon that leads to protein-synthesis inhibition
E. They combine with proteins in the cytoplasm of target cells, resulting a complex which stimulates the activity of certain genes that encode specific types of messenger RNA molecules

6. Which of the following statement(s) referring to protein hormones is/are true?
A. They consist of carbohydrate chains
B. They consist of amino acid chains
C. They consist of fatty acid chains
D. They consist of nucleotide chains
E. They have peptide molecules between their constituent molecules

7. Which of the following statement(s) referring to steroid hormones is/are true?
A. They are membrane-phospholipid soluble
B. They have a lipid structure
C. They combine with phospholipids in the cytoplasm of target cells

D. Inside the cell, they combine with proteins resulting a complex that stimulates genes which encode messenger RNA molecules (mRNA)
E. Inside the cell, they combine with carbohydrates resulting a complex that will trigger protein synthesis

8. What kind of cellular responses can be triggered by cyclic adenosine monophosphate (cAMP)?
A. Cellular division
B. Muscle relaxation
C. Alteration of membrane permeability
D. Inhibition of protein synthesis
E. Activation of certain enzymes

9. Choose the true statements referring to the hypophysis:
A. It is situated in the lower part of the encephalon
B. It is situated right behind the optic chiasm
C. It is also called pineal gland
D. Also called pituitary gland, it consists of two lobes (anterior and posterior)
E. Also called adenohypophysis, it consists of two lobes (superior and inferior)

10. The neurohypophysis:
A. Represents the anterior lobe of the hypophysis
B. Represents the posterior lobe of the hypophysis
C. It is an endocrine gland proper which secretes peptide hormones
D. It temporarily stores the neurohormones synthesized in the hypothalamus
E. It releases hormones as a response to stimuli coming from the hypothalamic neurons

11. Choose the true statements referring to the adenohypophysis:
A. It is the posterior lobe of the hypophysis and secretes ADH and oxytocin
B. It is controlled by the hypothalamus which secretes stimulating and inhibiting hormones
C. It secretes tropic hormones which control other endocrine glands
D. It is considered the „conductor" gland of the endocrine system
E. It secretes lipid-derived tropic hormones (steroid or non-steroid)

12. Choose the correct associations from below:
A. Posterior lobe of hypophysis – follicle-stimulating hormone – skin pigmentation
B. Adenohypophysis – protein hormones – human growth hormone (HGH), prolactin
C. Tropic hormones - adrenocorticotropic hormone (ACTH) – controls the adrenal medulla
D. Neurohypophysis – posterior lobe of hypophysis – releases the antidiuretic hormone
E. STH – somatotropic hormone – 91 amino acids in the protein chain

13. What are the effects of the somatotropic hormone (STH) on metabolism?
A. It stimulated protein synthesis, by introducing amino acids into cells
B. It stimulates intracellular protein degradation processes
C. It ensures fat mobilisation from the adipose tissue
D. It ensures fat storing in the adipose tissue
E. By stimulating protein synthesis, it accelerates body growth

14. The following statement(s) referring to the thyroid-stimulating hormone (TSH) is/are true:
A. The synthesis and release of thyroid hormones take place under the action of adenohypophyseal TSH
B. The synthesis and release of thyroid hormones take place under the action of adenohypophyseal STH
C. It is a tropic hormone produced by the anterior lobe of the hypophysis
D. It is a tropic hormone produced by the posterior lobe of the hypophysis
E. TSH stimulates iodine capture by the thyroid gland

15. Choose the true statements referring to the antidiuretic hormone (ADH):
A. It stimulates water reabsorption by acting on the kidney tubules

B. Induces the increase of the blood volume
C. It increases blood volume and decreases blood pressure
D. It induces vasodilation, thus increasing blood pressure
E. It induces vasoconstriction, thus increasing blood pressure

16. Choose the true statements referring to the thyroid gland:
A. It is located in the neck's soft tissues
B. It is situated posterior to the larynx
C. It is situated anterior to the larynx
D. It consists of three lateral lobes, one of which is the thyroid isthmus
E. It consists of two lateral lobes, interconnected by a thin band of tissue called isthmus

17. Which of the following statement(s) referring to thyroid hormones is/are true?
A. T_3 is also called thriiodothyroxine
B. T_3 is also called thriiodothyronine
C. T_3 is also called tetraiodothyronine
D. T_4 is also called thyroxine
E. T_4 is also called tetraiodothyroxine

18. Which of the following effects is caused by thyroid hormones?
A. Stimulation of enzyme activity associated with glucose metabolism
B. Inhibition of enzyme activity associated with glucose metabolism
C. Increased basal metabolic rate
D. Depletion of cellular oxygen uptake and of the quantity of heat released by them
E. Increase of cellular oxygen uptake and of the quantity of heat released by them

19. What happens in the absence of food iodine?
A. The thyroid atrophies (decreases in size)
B. Goitre develops (enlargement of the thyroid)
C. The thyroid cannot produce T_3 and T_4
D. Nothing happens, the body synthesizing iodine from precursors
E. Graves disease develops (exophthalmic goitre)

20. The following statement(s) referring to the parathyroid glands is/are true:
A. They consist of four small masses of glandular tissue located on the anterior face of the thyroid
B. They are exocrine glands which empty their secretory products in the oral cavity
C. They consist of four small masses of glandular tissue located on the posterior face of the thyroid
D. Each of them is about the size of a pea
E. They consist of two small glands located on the posterior face of the thyroid

21. Choose the effects of parathormone (PTH) on bones:
A. It inhibits osteoclast activity
B. It stimulates osteoclast activity
C. It increases bone calcium resorption
D. It decreases calcium resorption in the renal tubules
E. It decreases calcium resorption in the intestinal mucosa

22. The following statement(s) referring to the diseases induced by parathormone (PTH) hypersecretion is/are true:
A. It induces the decrease of plasma concentration
B. They can also be caused by a parathyroid tumour
C. They are never induced by a parathyroid tumour
D. Its characteristic signs are represented by bone deformity
E. Its characteristic signs are represented by low bone density

23. The following statement(s) referring to the pancreas is/are true:
A. It is the largest endocrine gland, divided into two equal lobes

B. It is a large, flattened, glandular organ
C. It lies in the abdominal cavity, posterior to the stomach and peritoneum
D. It lies in the abdominal cavity, anterior to the stomach and peritoneum
E. It has a double function, digestive and endocrine

24. Choose the correct statement(s) referring to insulin:
A. It is secreted by the β (beta) cells in the islets of Langerhans
B. It is secreted after food ingestion
C. It is secreted in the absence of food intake
D. It is a protein hormone with the molecule consisting in 51 amino acids arranged in two chains
E. It is secreted when the level of blood glucose is low

25. Choose the correct statement(s) referring to glucagon:
A. It is secreted in the absence of food intake
B. It is secreted when blood sugar levels are high
C. It is secreted by α (alpha) cells in the islets of Langerhans
D. It facilitates glycogenolysis in the liver
E. Its action on the liver results in the release of glycogen molecules in the blood

26. Choose the correct statement(s) referring to the suprarenal (adrenal) glands:
A. They are paired glands, located at the bottom of the kidneys
B. They are in number of two, located at the bottom of the kidneys
C. They have a cortical (inner) part and a medullar (outer) part
D. They have a cortical (outer) part and a medullar (inner) part
E. They have a cortical part, which has an endocrine function, and a medullar part, which has an exocrine function

27. Choose the correct statement(s) referring to the suprarenal (adrenal) gland hormones:
A. The inner part represented by the medulla secretes protein hormones
B. The cortex secretes glucocorticoid and mineralocorticoid hormones
C. The outermost part of the gland secretes cortisol and aldosterone
D. The hormones secreted by the medulla are lipid hormones
E. The hormones of the cortex contribute to the regulation of the mineral and energy balance

28. The glucocorticoid hormones:
A. Are mainly represented by cortisol
B. Influence the mineral and energy metabolism
C. Influence carbohydrate, lipid and protein metabolism
D. Stimulate vasodilation
E. Have an anti-inflammatory effect

29. Choose the true statement(s) referring to the steroid hormones secreted by the adrenal cortex:
A. Some of them influence carbohydrate metabolism (cortisol)
B. Mineralocorticoids regulate sodium balance in the body
C. Sex hormones increase the amount of hormones produced by the gonads
D. They have a characteristic nucleotide-derived structure
E. Their synthesis originates in a complex ringlike structure which contains nitrogen and hydrogen atoms

30. Choose the true statement(s) referring to the adrenal medulla:
A. It represents the innermost part of the adrenal gland
B. It secretes hormones with complementary action to that of the sympathetic nervous system
C. Its hormones are derived from cholesterol
D. Its hormones are represented by adrenaline (epinephrine) and noradrenaline (norepinephrine)
E. It secretes three types of hormones: mineralocorticoids, glucocorticoids and amine hormones

31. The adrenal medulla secretes:

A. Amine hormones, with complementary action to that of the sympathetic nervous system
B. Steroids, which influence sexual characteristics
C. Glucocorticoids (cortisol) and mineralocorticoids (aldosterone)
D. Catecholamines, which act in consonance with the sympathetic nervous system
E. Catecholamines: adrenaline (epinephrine) and noradrenaline (norepinephrine)

32. The main effects of catecholamines are:
A. To prepare the body for a sustained physical effort
B. Are involved in emergency responses
C. To decrease blood sugar through glycogenolysis
D. To increase blood sugar through glycolysis
E. To prepare the body for the „fight or flight" response

33. The following statement(s) is/are true about the thymus:
A. It is located in the inferior mediastinum
B. It is situated behind the sternum
C. It secretes thymosin
D. It develops with age
E. It contributes to B lymphocyte maturation

34. Choose the true statement(s) referring to melatonin:
A. It is a steroid hormone (steroid)
B. It is secreted by the pineal gland
C. It is believed to regulate the secretion of other hormones
D. Together with melanin, they form an enzyme system
E. It influences the circadian rhythm (the day – night cycle)

35. Which of the associations below between endocrine glands and endocrine dysfunctions are correct?
A. Neurohypophysis – hypophyseal gigantism
B. Adenohypophysis – hypophyseal dwarfism
C. Thyroid – exophthalmic goitre
D. Adrenal medulla - Cushing syndrome
E. Adrenal cortex – Addison disease

36. Choose the true statement(s) about hormones:
A. Somatotropic hormone (STH) stimulates body growth
B. Thyroid hormones, amine hormones can be synthesized only when food contains a proper iodine contents
C. Prolactin and STH are neurohypophyseal hormones
D. Luteinizing hormone (LH) is a tropic hormone and stimulates testicular interstitial cell maturation
E. Glucocorticoids are represented mainly by cortisol

37. The following statement(s) is/are true about the location of the endocrine glands:
A. The thyroid is situated anterior and superior to the pharynx
B. The epiphysis is situated in the mesencephalon, on the superior wall of ventricle III
C. The parathyroid is located on the anterior surface of the thyroid gland
D. The hypophysis is situated in the lower part of the encephalon
E. The pancreas is located in the abdominal cavity, posterior to the stomach

38. Choose the true statement(s) about hormones:
A. Adrenaline and noradrenaline are involved in emergency situations („fight or flight")
B. Calcitonin regulates osteoclast activity and increases blood calcium concentration
C. Mineralocorticoids regulate lipid and carbohydrate metabolism
D. Glucocorticoids regulate protein and carbohydrate metabolism
E. Melatonin can influence the reproductive organs, especially the ovaries

39. Choose the correct associations from below:
A. Pancreas – glucagon – glycogen breakdown in the liver
B. Pancreas – insulin – glycogen breakdown in muscles
C. Adrenal cortex – mineralocorticoids – regulation of sodium balance
D. Adrenal medulla – glucocorticoids – calcium storage in bones
E. Epiphysis – melatonin – influencing the day-night cycle

40. Choose the true statement(s) referring to the endocrine system:
A. Digestive endocrine cells can be located in the epithelium that lines the stomach or the small bowel
B. The liver, the lungs and the kidneys can secrete minute amounts of steroid hormones
C. Pancreatic cells produce a hormone called erythropoietin which is involved in digestion
D. Kidney cells produce a hormone called erythropoietin which stimulates haematopoiesis
E. The liver, the lungs and the kidneys can secrete small amounts of prostaglandins

41. Choose the true statement(s) referring to the energy-rich chemical compounds:
A. DNA is exclusively present in the cell nucleus
B. ATP is transformed into AMP_C under the action of the enzyme adenylate cyclase
C. Unbinding AMP yields ADP and an inorganic phosphate molecule
D. Creatine phosphate ensures ATP reconstruction by muscle oxidation
E. Unbinding an ATP molecule, with the subsequent formation of ADP and an inorganic phosphate molecule, releases energy (7.3 kilocalories/ATP mol)

42. Choose the correct associations from below:
A. Parathormone hyposecretion – low bone density
B. Parathormone hypersecretion – low bone density
C. Graves disease – thyroxine and triiodothyronine deficiency
D. Myxoedema – thyroxine and triiodothyronine deficiency
E. Inactive pancreatic beta cells – diabetes insipidus

43. Choose the *incorrect* associations from below:
A. High number of insulin receptors – type 2 diabetes mellitus
B. Low number of insulin receptors - type 2 diabetes mellitus
C. Frequent urination and excessive thirst – insulin hyposecretion
D. Cretinism – defective growth, normal intellect
E. Parotid tumour – parathormone hypersecretion

44. Which of the following statements referring to diabetes mellitus are true?
A. Low insulin quantity, its absence or reduced number of insulin receptors indicate diabetes (type 1, type 2)
B. In diabetes, the kidney facilitates the elimination of excessive blood glucose through the liver
C. In diabetes, the kidney facilitates the elimination of excessive blood glucose through urine
D. The excretion of glucose through urine happens in parallel with the decrease of the eliminated water quantity and an increase in urine concentration
E. The excretion of glucose through urine happens in parallel with the increase of the eliminated water quantity and the dilution of urine

45. The symptoms of diabetes mellitus include:
A. An overall lack of energy in the entire body
B. Excessive thirst
C. The excretion of excessive blood glucose through urine
D. Increased quantity of water excreted by the kidneys and, implicitly, increased urine volume
E. Decreased quantity of water excreted by the kidneys and, implicitly, decreased urine volume

46. Addison's disease occurs as a result of:
A. Glucocorticoid hyposecretion
B. Glucocorticoid hypersecretion

C. Mineralocorticoid hyposecretion
D. Mineralocorticoid hypersecretion
E. Catecholamine hyposecretion

47. Referring to Cushing syndrome, it is true that:
A. It occurs as a consequence of glucocorticoid hypersecretion
B. It occurs as a consequence of glucocorticoid hyposecretion
C. It is accompanied by facial plethora and high blood pressure
D. It is accompanied by darkened skin
E. It is accompanied by generalized weak muscle tone

48. Choose the correct associations:
A. Addison's disease – glucocorticoid hypersecretion – hyperhydration
B. Cushing syndrome – glucocorticoid hypersecretion – high blood pressure
C. Addison's disease – glucocorticoid hyposecretion – low blood pressure
D. Cushing syndrome – glucocorticoid hyposecretion – low blood pressure
E. Graves disease – thyroxine hypersecretion - exophthalmia

49. Which of the following series of substances contain at least one hormone:
A. Maltase, maltose, glycine, secretin, haemoglobin
B. Acetylcholinesterase, intrinsic factor, myoglobin, erythropoiesis
C. Phosphocreatine, histone, acetylcholine, prostaglandins, epinephrine
D. Tyrosine, catalase, cyclic adenosine monophosphate, troponin
E. Rh factor, fibrin, thromboplastin, cholecystokinin

50. Which of the following statements characterise hormones?
A. They are substances which in the target cells bind to specific receptors
B. They can have an amine structure (catecholamines)
C. They decrease substratum activation energy in a chemical reaction, accelerating the reaction
D. They can be excreted in bile, as biliary acids
E. They can affect the cell membrane facilitating glucose transport into cells and decreasing blood glucose concentration (insulin)

ANSWERS

CHAPTER 1 ▸ Introduction to anatomy and physiology. Cells and cell physiology

1.BCD; 2.AC; 3.BDE; 4.ABD; 5.ABDE; 6.ADE; 7.AE; 8.ACD; 9.ACE; 10.ACD; 11.CDE; 12.BD; 13.ACD; 14.ACD; 15.BD; 16.ABCE; 17.ACD; 18.BDE; 19.ABE; 20.ADE; 21.ABE; 22.ABD; 23.ACD; 24.ACE; 25.ABE; 26.BCD; 27.ACE; 28.ACE; 29.BCE; 30.AD; 31.ACE; 32.BE; 33.ABE; 34.ABE; 35.ABD; 36.ABCE; 37.ACD; 38.BDE; 39.ABE; 40.ABCE; 41.ACE; 42.AC; 43.ACD; 44.BDE; 45.BDE; 46.BCE; 47.ABCE; 48.ACE; 49.ACE; 50.ACE

CHAPTER 2 ▸ The nervous tissue. Organisation of the nervous tissue

1.BDE; 2.BCE; 3.ACD; 4.ABE; 5.BCD; 6.BDE; 7.ABD; 8.CDE; 9.BDE; 10.ACE; 11.BDE; 12.BDE; 13.ADE; 14.ACD; 15.ACD; 16.ACD; 17.CDE; 18.ADE; 19.BDE; 20.ABD; 21.ADE; 22.ABE; 23.BCE; 24.CD; 25.BCE; 26.BD; 27.ABD; 28.AC; 29.BC; 30.ABDE; 31.ACE; 32.ADE; 33.BCDE; 34.ACD; 35.ADE; 36.ACE; 37.BCDE; 38.BDE; 39.ABD; 40.BCD; 41.ABDE; 42.ABE; 43.ABE; 44.ABCE; 45.BDE; 46.ABD; 47.BCD; 48.ACD; 49.ABCE; 50.ABE

CHAPTER 3 ▸ Sense organs

1.BDE; 2.BCE; 3.BE; 4.ACE; 5.BCE; 6.ACE; 7.ACE; 8.ACE; 9.ACD; 10.ACD; 11.BCE; 12.CD; 13.CD; 14.ABE; 15.ABC; 16.ACD; 17.ABC; 18.ABCE; 19.ABE; 20.ABC; 21.BCE; 22.ACD; 23.D; 24.BE; 25.ACE; 26.ABD; 27.BCD; 28.BCE; 29.BCE; 30.AD; 31.ACD; 32.ACE; 33.ABE; 34.BCD; 35.ACE; 36.ABC; 37.DE; 38.BDE; 39.BD; 40.BCD; 41.ACE; 42.ABDE; 43.ABD; 44.BCE; 45.ABE; 46.BDE; 47.BDE; 48.ADE; 49.BCE; 50.ABE

CHAPTER 4 ▸ The bone tissue

1.ABD; 2.ADE; 3.BCE; 4.BCD; 5.BD; 6.ABE; 7.ADE; 8.ABD; 9.AC; 10.ACE; 11.ACD; 12.D; 13.ACD; 14.ACD; 15.ACD; 16.ADE; 17.BC; 18.ABC; 19.CDE; 20.BCE; 21.ADE; 22.D; 23.ABD; 24.BC; 25.BCE; 26.BCE; 27.ABD; 28.ADE; 29.ABE; 30.CD; 31.DE; 32.BCE; 33.CDE; 34.ACE; 35.ACD; 36.CDE; 37.ACE; 38.ACE; 39.ACD; 40.ABDE; 41.ABD; 42.ABE; 43.BDE; 44.BC; 45.BCE; 46.BCE; 47.ABD; 48.ADE; 49.BCE; 50.AD

CHAPTER 5 ▸ The muscular system

1.BD; 2.AB; 3.BCE; 4.CD; 5.ACE; 6.ABCD; 7.BE; 8.ABD; 9.ABD; 10.BD; 11.BCE; 12.ABD; 13.BDE; 14.ACE; 15.BDE; 16.BE; 17.ABE; 18.CDE; 19.ABD; 20.ADE; 21.ABE; 22.AC; 23.ACD; 24.ABE; 25.AE; 26.AB; 27.B; 28.AC; 29.BCD; 30.BE; 31.CDE; 32.AD; 33.ABC; 34.ABE; 35.CD; 36.ABE; 37.AD; 38.BE; 39.BC; 40.CE; 41.BC; 42.BCD; 43.BC; 44.ABD; 45.BDE; 46.BCE; 47.BDE; 48.AB; 49.BCD; 50.BD

CHAPTER 6 ▸ The digestive system

1.BC; 2.ABD; 3.ACE; 4.ABE; 5.BCD; 6.CD; 7.ACE; 8.ABE; 9.ADE; 10.ABDE; 11.ACD; 12.ABDE; 13.CD; 14.BCE; 15.ACE; 16.BCE; 17.BCE; 18.ABD; 19.ACE; 20.ABE; 21.DE; 22.BCE; 23.AD; 24.BD; 25.ABCD; 26.ABD; 27.ABD; 28.BDE; 29.ACD; 30.ABD; 31.BCD; 32.ABE; 33.ABCE; 34.BDE; 35.ACD; 36.CDE; 37.BD; 38.BCD; 39.ACE; 40.ACD; 41.ABC; 42.CDE; 43.AC; 44.BDE; 45.ABE; 46.ADE; 47.BCE; 48.BCD; 49.BCE; 50.BDE

CHAPTER 7 ▸ Blood and the cardiovascular system

1.ACDE; 2.ABD; 3.ABC; 4.BCD; 5.ACE; 6.ADE; 7.AD; 8.BCE; 9.CDE; 10.BDE; 11.BDE; 12.ACE; 13.ABDE; 14.ACE; 15.BE; 16.BE; 17.BDE; 18.BD; 19.ABCE; 20.BD; 21.BDE; 22.ACE; 23.BDE; 24.ACE; 25.ABE; 26.ABDE; 27.ABE; 28.ABE; 29.ADE; 30.ABD; 31.BDE; 32.BCD; 33.ABD; 34.ABE; 35.ACD;

36.ABD; 37.ACD; 38.ACE; 39.ADE; 40.ACE; 41.BDE; 42.ACE; 43.ABE; 44.ACD; 45.AD; 46.ABD; 47.ACE; 48.ABE; 49.ACD; 50.ACD

CHAPTER 8 ▸ The respiratory system. The urinary system

1.BC; 2.CD; 3.BCE; 4.D; 5.ACD; 6.ABDE; 7.ABD; 8.ABE; 9.ADE; 10.CD; 11.BCE; 12.ACE; 13.BCDE; 14.ACE; 15.ACD; 16.BCE; 17.BCD; 18.BCE; 19.ABE; 20.ACD; 21.ABD; 22.BCD; 23.BD; 24.AD; 25.CDE; 26.ACE; 27.BD; 28.ABDE; 29.BC; 30.AE; 31.ADE; 32.CDE; 33.BCD; 34.ACD; 35.ABDE; 36.BCE; 37.ABC; 38.BD; 39.ABC; 40.AD; 41.BC; 42.ACD; 43.ABD; 44.ACE; 45.ABDE; 46.ABD; 47.BCE; 48.CDE; 49.ABD; 50.ABD

CHAPTER 9 ▸ The reproductive system

1.ABCE; 2.ABD; 3.ACE; 4.ABD; 5.ABDE; 6.ACE; 7.ADE; 8.ACE; 9.ACE; 10.ABC; 11.CE; 12.ACE; 13.BCE; 14.BDE; 15.BDE; 16.BCD; 17.ACE; 18.ABE; 19.CE; 20.ACD; 21.ACE; 22.ACD; 23.ABD; 24.CE; 25.ABE; 26.ABD; 27.ABDE; 28.CE; 29.ACE; 30.ABD; 31.BCE; 32.ABE; 33.CE; 34.CDE; 35.ACE; 36.BDE; 37.ACD; 38.AD; 39.AD; 40.BE; 41.ACE; 42.BCE; 43.ACD; 44.C; 45.BDE; 46.ABD; 47.BCD; 48.ACE; 49.BCE; 50.ABE

CHAPTER 10 ▸ The endocrine glands

1.ADE; 2.ADE; 3.ACE; 4.BC; 5.AE; 6.BE; 7.ABD; 8.ACE; 9.ABD; 10.BDE; 11.BCD; 12.BD; 13.ACE; 14.ACE; 15.ABE; 16.ACE; 17.BD; 18.ACE; 19.BC; 20.CD; 21.BC; 22.BDE; 23.BCE; 24.ABD; 25.ACD; 26.BD; 27.BCE; 28.ACE; 29.ABC; 30.ABD; 31.ADE; 32.ABE; 33.BC; 34.BCE; 35.BCE; 36.ABDE; 37.BDE; 38.ADE; 39.ACE; 40.ADE; 41.BE; 42.BD; 43.ADE; 44.ACE; 45.ABCD; 46.AC; 47.ACE; 48.BCE; 49.ACE; 50.ABE

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