

# Sample test questions

## INTEGRATED TEST EXAM “Krok 1” *Medicine*



1. A young man has come to the genetic consultation. He complains of abnormalities in his physical and reproductive development. Microscopy of his oral mucosa cells shows one Barr body. What karyotype is the most likely in this young man?

- A. 47, XXY
- B. 45, X0
- C. 47, XY, +21
- D. 47, XY, +18
- E. 47, XYY

2. The mother's karyotype has 45 chromosomes. It was determined that translocation of chromosome 21 to chromosome 14 had occurred. What disorder is likely to be observed in the child of this woman if the father's karyotype is normal?

- A. Down syndrome
- B. Klinefelter syndrome
- C. Patau syndrome
- D. Edwards syndrome
- E. Morris syndrome (androgen insensitivity)

3. During regular examination of schoolchildren, a scrape from the perianal folds of a 10-year-old girl shows asymmetrical oval eggs with larvae inside. What diagnosis can be made?

- A. Enterobiasis
- B. Ascariasis
- C. Amebiasis
- D. Trichuriasis
- E. Ancylostomiasis

4. A young woman, a foreign student from Tehran, has made an appointment with the urologist. She complains of the sensation of heaviness in her lower abdomen and a small amount of blood being excreted with urine at the end of each urination. Microscopy of urine detects the presence of parasite eggs, approximately 140x70 micron in size, with a terminal spike. What diagnosis can be made by the infectious diseases specialist?

- A. Schistosomiasis
- B. Opisthorchiasis
- C. Dicrocoeliasis
- D. Paragonimiasis
- E. Fascioliasis

5. Cells of a person working in the Chernobyl Exclusion Zone have undergone a mutation in DNA molecule. However, with time the damaged interval of DNA molecule restored its initial structure with a specific enzyme. In this case the following occurred:

- A. Repair
- B. Replication
- C. Transcription
- D. Reverse transcription
- E. Translation

6. A man is a carrier of HIV that is an RNA virus. The cells of this patient synthesize viral DNA. This process is based on:

- A. Reverse transcription
- B. Replication
- C. Transcription
- D. Repair
- E. Translation

7. The parents with normal hearing have two daughters and a son, who are congenitally deaf. Their other 5 children are healthy. What is the pattern of deafness inheritance in this case?

- A. Autosomal recessive
- B. Autosomal dominant
- C. X-linked recessive
- D. X-linked dominant
- E. Y-linked

8. Ingestion of plants and mushrooms that grow along highways is dangerous due to risk of lead poisoning. What is the main source of environmental pollution with this chemical element?

- A. Exhaust fumes
- B. Sewage
- C. Acid rains
- D. Herbicides
- E. Chemical fertilizers

9. Long-term taking of medicines can affect cells of the liver. Particularly, it can cause marked hypertrophy of agranular endoplasmic reticulum due to the following function of this organelle:

- A. Detoxication of harmful substances
- B. Nucleic acid synthesis
- C. Protein synthesis
- D. Formation of maturation spindle
- E. Intracellular digestion

10. Dwellers of a village located in the taiga make a living by harvesting berries. Lately the occurrence of alveococcosis in the village population has increased. What is the source of invasion in this case?

- A. Foxes
- B. Fish
- C. Sick people
- D. Birds
- E. Rodents

1. A patient with severe poisoning was brought into the intensive care unit. In the course of complex treatment the subclavian vein needs to be catheterized for medicine administration. This vein is located in the following topographic structure:

- A. *Spatium antescalenum*
- B. *Spatium interscalenum*
- C. *Spatium retrosternocleidomastoideus*
- D. *Spatium interaponeuroticum suprasternale*
- E. *Trigonum omotrapezoideum*

2. A 52-year-old woman came to the neurologist with complaints of loss of skin sensitivity on the right half of her face in the area of the lower eyelid, nasal arch, and upper lip. What branch of what nerve is damaged in this patient?

- A. Maxillary branch of the trigeminal nerve
- B. Greater petrosal nerve branching from the facial nerve
- C. Ophthalmic branch of the trigeminal nerve
- D. Mandibular branch of the trigeminal nerve
- E. Chorda tympani branching from the facial nerve

3. A patient with periodontitis of the lower molar came to the doctor. It was determined that the inflammatory process spread to the lymph nodes. What lymph nodes were the first to be affected by the inflammatory process?

- A. Submandibular
- B. Lateral cervical
- C. Anterior cervical
- D. Submental
- E. Facial

4. After an X-ray examination of the tuberculosis clinic patient, he was diagnosed with tumor of the right lung. During operation the surgeon removed the middle lobe of the patient's right lung. This lobe includes:

- A. *Segmentum laterale et segmentum mediale*
- B. *Segmentum basale anterius et posterius*
- C. *Segmentum anterius et segmentum apicale*
- D. *Segmentum lingualare superius et inferius*
- E. *Segmentum apicale (superius) et segmentum basale mediale*

5. A 30-year-old man with an incised wound on the plantar surface of the left foot was brought to the traumatology department. Lifting of the lateral side of the foot is limited. What muscle is likely to be functionally disturbed?

- A. Peroneus longus muscle
- B. Anterior tibial muscle
- C. Flexor hallucis longus muscle
- D. Triceps muscle of calf
- E. Soleus muscle

6. An ovarian tumor was detected in a woman. She is prescribed a surgery. What ligament should be severed by the surgeon to separate the patient's ovary from the uterus?

- A. Proper ovarian ligament
- B. Broad ligament of the uterus
- C. Lateral umbilical ligament
- D. Suspensory ligament of the ovary
- E. Round ligament of the uterus

7. A 45-year-old woman presents with breast cancer. Metastases can spread in this case to the following regional lymph nodes:

- A. Axillary, parasternal
- B. Abdominal, cervical
- C. Cervical, parasternal
- D. Parasternal, bronchomediastinal
- E. Aortic, bronchomediastinal

8. A 35-year-old man with a hand injury came to the traumatology department. Examination revealed an incised wound on the palmar surface of the left hand; middle phalanges of digits II-IV cannot be flexed. What muscles are damaged?

- A. Flexor digitorum superficialis
- B. Flexor digitorum profundus
- C. Lumbrical muscles
- D. Palmar interossei
- E. Dorsal interossei

9. Clinical course of urolithiasis was complicated by the passage of a renal calculus. Where in the ureter is it most likely to stop?

- A. At the border between the abdominal and pelvic segments
- B. In the renal pelvis
- C. In the middle of the abdominal segment
- D. 2 cm above the entrance to the urinary bladder
- E. 5 cm above the pelvic segment

10. The surgeon noticed aggregated lymphoid nodules (Peyer's patches) on the intestinal mucosa. What portion of the intestine is it?

- A. Ileum
- B. Jejunum
- C. Cecum
- D. Duodenum
- E. Rectum

11. An oncology patient is to undergo a surgery on the descending colon. Name the main source of blood supply to this organ:

- A. Inferior mesenteric artery
- B. Superior mesenteric artery
- C. Celiac trunk
- D. Middle colic artery
- E. Splenic artery

**12.** A patient presents with an inner ear inflammation. On examination the doctor states that the 1st neurons of the auditory analyzer are affected. Where are these neurons located?

- A.** *G. spirale*
- B.** *G. vestibulare*
- C.** *G. geniculi*
- D.** *G. trigeminale*
- E.** *G. ciliare*

**13.** A victim has received a deep incised stab wound to the upper posterior surface of the shoulder. Extension of elbow, hand, and digits is impaired; skin sensitivity of the posterior surface of the shoulder and forearm is lost. What nerve is damaged in this case?

- A.** *N. radialis*
- B.** *N. ulnaris*
- C.** *N. cutaneus brachii medialis*
- D.** *N. medianus*
- E.** *N. musculocutaneus*

**14.** During an invasive operation the surgeon needs to access the omental bursa of the peritoneal cavity via the omental foramen (foramen of Winslow). What anatomical structure makes up the anterior border of this foramen?

- A.** Hepatoduodenal ligament
- B.** Hepatorenal ligament
- C.** Visceral surface of liver
- D.** Superior part of duodenum
- E.** Greater omentum

1. Histone protein synthesis is artificially blocked in a cell. What cell structure will be damaged as a result?

- A. Nuclear chromatin
- B. Nucleolus
- C. Golgi apparatus
- D. Cell membrane
- E. Nuclear membrane

2. Some diseases of large intestine lead to the changes in the quantitative ratio between mucosal epithelial cells. What cell types are normally predominant in the cryptal epithelium of the large intestine?

- A. Goblet cells
- B. Ciliated columnar epithelial cells
- C. Endocrine cells
- D. Cells with acidophilic granules
- E. Poorly differentiated cells

3. Examination of a surgically excised adrenal gland shows large cells that can be impregnated with a potassium dichromate solution. What hormone is being synthesized by these cells?

- A. Adrenaline
- B. Aldosterone
- C. Secretin
- D. Thyroxine
- E. Cholecystokinin

4. An inflammation can be characterized by hemocapillary dilation in the affected area, decreased blood circulation, and increased vessel wall permeability. What cells play the key role in this process?

- A. Tissue basophils
- B. Fibroblasts
- C. Plasma cells
- D. Eosinophils
- E. Macrophages

5. A histological specimen demonstrates a vessel with the wall that consists of endothelium, basement membrane, and loose connective tissue. This vessel belongs to the following type:

- A. Non-muscular vein
- B. Artery
- C. Muscular vein
- D. Hemocapillary
- E. Lymph capillary

6. Parenchyma of an organ is composed of pseudounipolar neurons localized under the capsule of connective tissue. Central place belongs to nerve fibers. Name this organ:

- A. Spinal ganglion
- B. Sympathetic ganglion
- C. Intramural ganglion
- D. Nerve trunk
- E. Spinal cord

7. A histological specimen shows significant amount of mucous connective tissue (Wharton's jelly), vessels, as well as remnants of yolk sac stalk and allantois. Name this organ:

- A. Umbilical cord
- B. Esophagus
- C. Ureter
- D. Urethra
- E. Vermiform appendix

1. A 40-year-old woman on examination presents with intensified basal metabolic rate. What hormone present in excess leads to such condition?

- A. Triiodothyronine
- B. Thyrocalcitonin
- C. Glucagon
- D. Aldosterone
- E. Somatostatin

2. Toxic damage to hepatic cells resulted in disruption of the patient's liver function and the patient developed edemas. What changes of blood plasma are the main cause of edema development?

- A. Decrease of albumin content
- B. Increase of globulin content
- C. Decrease of fibrinogen content
- D. Increase of albumin content
- E. Decrease of globulin content

3. An isolated heart was used to study excitation conduction velocity in different areas of the heart. What area had the lowest velocity of excitation conduction?

- A. Atrioventricular node
- B. His bundle
- C. Purkinje fibers
- D. Atrial myocardium
- E. Ventricular myocardium

4. A 40-year-old person developed elevated blood pressure after an emotional excitement. What is the likely cause of this effect?

- A. Increased sympathetic nervous system tone
- B. Arteriolar dilation
- C. Decreased cardiac contraction frequency
- D. Hyperpolarization of cardiomyocytes
- E. Increased parasympathetic nervous system tone

5. A patient has elevated blood pressure due to increased vascular tone. To lower the blood pressure in this case it is necessary to prescribe the blockers of:

- A.  $\alpha$ -adrenoceptors
- B.  $\beta$ -adrenoceptors
- C.  $\alpha$ - and  $\beta$ -adrenoceptors
- D. Muscarinic acetylcholine receptors
- E. Histamine H1 receptors

6. ABO blood group is being determined. Erythrocyte agglutination occurred when standard sera of group I and group II were introduced into the blood being analyzed, while group III serum caused no agglutination. What agglutinogens do these erythrocytes have?

- A. B
- B. A
- C. A and B
- D. C
- E. D and C

7. What changes can be expected to occur in the isolated heart of a toad, if excessive amount of calcium chloride is introduced into its perfusate?

- A. Increased cardiac contraction force and frequency
- B. Decreased cardiac contraction force
- C. Increased cardiac contraction frequency
- D. Increased cardiac contraction force
- E. Diastolic cardiac arrest

8. After hyperventilation an athlete developed a brief respiratory arrest. It occurred due to the following changes in the blood:

- A. Decrease of  $CO_2$  pressure
- B. Decrease of pH
- C. Increase of  $CO_2$  pressure
- D. Decrease of  $O_2$  pressure
- E. Increase of  $CO_2$  and  $O_2$  pressure

9. A person has increased pulmonary ventilation due to physical exertion. What indicator of external respiration will be significantly increased compared to the resting state?

- A. Respiratory volume
- B. Vital lung capacity
- C. Inspiratory reserve volume
- D. Expiratory reserve volume
- E. Total lung capacity

10. A patient developed punctate hemorrhages after a tourniquet had been applied. It occurred due to functional disturbance of the following blood corpuscles:

- A. Platelets
- B. Eosinophils
- C. Monocytes
- D. Lymphocytes
- E. Neutrophils

11. The dorsal root of the spinal nerve of a test animal was severed. What changes will occur in the innervation area?

- A. Loss of sensitivity
- B. Loss of motor function
- C. Decreased muscle tone
- D. Increased muscle tone
- E. Loss of sensitivity and motor function

12. After a certain CNS structure had been destroyed in a test animal, this animal lost its orienting reflexes. What structure had been destroyed?

- A. Corpora quadrigemina
- B. Red nuclei
- C. Lateral vestibular nuclei
- D. Substantia nigra
- E. Medial reticular nuclei

13. On examination the patient was determined to have a strong, balanced, inert type of higher nervous activity according to Pavlov's classification. What temperament according to Hippocrates is it?

- A. Phlegmatic
- B. Sanguine
- C. Choleric
- D. Melancholic
- E. -

14. A 45-year-old woman presents with insufficient secretion of enterokinase enzyme. Enterokinase deficiency can cause disturbance of the following digestive function:

- A. Protein hydrolysis
- B. Carbohydrate hydrolysis
- C. Lipid hydrolysis
- D. Vitamin absorption
- E. Lipid absorption

15. Systemic blood pressure of a person equals 120/65 mm Hg. Blood ejection into aorta occurs when left ventricular pressure exceeds:

- A. 65 mm Hg
- B. 10 mm Hg
- C. 90 mm Hg
- D. 100 mm Hg
- E. 120 mm Hg

16. Prolonged vomiting resulted in dehydration of the patient's body. Under these conditions, water retention in the body is ensured primarily due to increased secretion of the following hormone:

- A. Vasopressin
- B. Aldosterone
- C. Natriuretic hormone
- D. Adrenaline
- E. Calcitonin

17. *KCl* concentration in a solution that surrounds an isolated cell was increased. How will resting membrane potential (RMP) and cell excitability change in this case?

- A. RMP decreases, excitability increases
- B. RMP increases, excitability increases
- C. RMP increases, excitability decreases
- D. RMP decreases, excitability remains unchanged
- E. RMP and excitability remain unchanged

18. Human brain produces endogenous peptides that are similar to morphine and can reduce pain perception. Name these

peptides:

- A. Endorphins
- B. Liberins
- C. Vasopressin
- D. Oxytocin
- E. Statins

19. I.M. Siechenov has proven that a tired limb restores its working capacity faster if during its period of rest another limb works. It became a basis for the concept of:

- A. Active rest
- B. Parabiosis
- C. Pessimism
- D. Optimum
- E. Fatigue

20. Domestic accident has resulted in a significant blood loss in the patient, which was accompanied by a drop in blood pressure. What hormones ensure quick restoration of the blood pressure caused by a blood loss?

- A. Adrenaline, vasopressin
- B. Cortisol
- C. Reproductive hormones
- D. Oxytocin
- E. Aldosterone

21. An experiment was conducted to measure the skin sensitivity threshold. What patches of skin have the highest sensitivity threshold?

- A. Back
- B. Dorsal surface of the hand
- C. Shoulder
- D. Face
- E. Shin

22. A student, whose educational achievements throughout the semester were poor, feels emotionally tense during the final test. What is the primary cause that induced the leading mechanism of emotional tension in this case?

- A. Lack of information
- B. Lack of time
- C. Lack of time and energy
- D. Lack of energy
- E. Lack of energy and information

23. After a trauma the patient has developed right-sided paralysis and disturbed pain sensitivity. On the left side no paralysis are observed, but pain and thermal sensitivity is disturbed. What is the cause of this condition?

- A. Unilateral right-side spinal cord injury
- B. Midbrain injury
- C. Brainstem injury
- D. Cerebellar injury
- E. Motor cortex injury

1. A 3-year-old child with elevated body temperature has taken aspirin and developed increased hemolysis of erythrocytes. In this case hemolytic anemia can be caused by congenital deficiency of the following enzyme:

- A. Glucose 6-phosphate dehydrogenase
- B. Glucose 6-phosphatase
- C. Glycogen phosphorylase
- D. Glycerol-phosphate dehydrogenase
- E. Gamma-glutamyl transferase

2. Collagenosis patients typically present with the processes of connective tissue destruction. The presence of these processes can be confirmed by the increase in:

- A. Blood oxyproline and oxylysine
- B. Blood creatine and creatinine
- C. LDH-isoenzyme activity in the blood
- D. Transaminase activity in the blood
- E. Blood urates

3. During diabetes mellitus and starvation, the number of acetone bodies in blood increases. These bodies are used as a source of energy and are synthesized from the following substance:

- A. Acetyl-CoA
- B. Succinyl-CoA
- C. Citrate
- D. Malate
- E. Ketoglutarate

4. Blood test of the patient revealed albumine content of 20 g/L and increased activity of lactate dehydrogenase isoenzyme 5 (LDH<sub>5</sub>). These results indicate disorder of the following organ:

- A. Liver
- B. Kidneys
- C. Heart
- D. Lungs
- E. Spleen

5. A patient presents with an acute attack of cholelithiasis. Laboratory examination of the patient's feces will show the following in this case:

- A. Negative reaction to stercobilin
- B. Positive reaction to stercobilin
- C. Connective tissue
- D. Partially digested cellulose
- E. Starch granules

6. A patient with diabetes mellitus after an insulin injection lost his consciousness and developed convulsions. What will be the result of a biochemical test for blood glucose level in this case?

- A. 2.5 mmol/L
- B. 3.3 mmol/L
- C. 8.0 mmol/L
- D. 10 mmol/L
- E. 5.5 mmol/L

7. A 27-year-old patient presents with pathologic changes in the liver and brain. Blood plasma exhibits acute decrease in copper levels, while urine copper levels are elevated. The patient is diagnosed with Wilson disease. To confirm this diagnosis it is necessary to measure activity of the following enzyme in the patient's blood serum:

- A. Ceruloplasmin
- B. Carbonic anhydrase
- C. Xanthine oxidase
- D. Leucine aminopeptidase
- E. Alcohol dehydrogenase

8. The Gerontology Institute recommends older people to take vitamin complexes that contain vitamin E. What is the main function of this vitamin?

- A. Antioxidant
- B. Antihemorrhagic
- C. Antiscorbutic
- D. Antineuritic
- E. Antidermatitic

9. Ammonia is extremely toxic for human CNS. What is the main way of ammonia neutralization in the nervous tissue?

- A. Glutamine synthesis
- B. Ammonium salts synthesis
- C. Urea synthesis
- D. Transamination
- E. Formation of paired compounds

10. People, who for a long time remained in hypodynamic state, develop intense pain in the muscles after a physical exertion. What is the most likely cause of this pain?

- A. Accumulation of lactic acid in muscles
- B. Intensive breakdown of muscle proteins
- C. Accumulation of creatinine in muscles
- D. Decreased content of lipids in muscles
- E. Increased content of ADP in muscles

11. Human genetic apparatus consists of approximately 30 thousand of genes, while the number of antibody variants can be as high as millions. What mechanism leads to formation of new genes that ensure the synthesis of such a number of antibodies?

- A. Genetic recombination
- B. Gene amplification
- C. DNA replication
- D. DNA repair
- E. Formation of Okazaki fragments

12. Chronic overdose of glucocorticoids leads to the development of hyperglycemia in a patient. Name the process of carbohydrate metabolism that results in elevated blood glucose levels:



- A. Gluconeogenesis
- B. Glycogenolysis
- C. Aerobic glycolysis
- D. Pentose-phosphate pathway
- E. Glycogenesis

13. A patient for a long time was on an imbalanced diet low in proteins, which resulted in hepatic fatty infiltration. This condition is likely to develop if a certain substance is absent in a person's diet. Name this substance:

- A. Methionine
- B. Alanine
- C. Cholesterol
- D. Acetic acid
- E. Biotin

14. A patient, who has been subsisting exclusively on polished rice, has developed polyneuritis due to thiamine deficiency. What substance is an indicator of such avitaminosis, when it is excreted with urine?

- A. Pyruvic acid
- B. Malate
- C. Methylmalonic acid
- D. Uric acid
- E. Phenyl pyruvate

15. A 40-year-old man with pulmonary tuberculosis was prescribed isoniazid. Prolonged taking of this drug can result in development of the following vitamin deficiency:

- A. Pyridoxine
- B. Thiamine
- C. Cobalamin
- D. Biotin
- E. Folic acid

16. Disturbed activity of trypsin and chymotrypsin leads to disturbed protein breakup in the small intestine. Activity of these enzymes depends on the presence of the following factor:

- A. Enterokinase
- B. Pepsin
- C. Bile acids
- D. Hydrochloric acid
- E.  $Na^+$  salts

17. A newborn presents with weak suckling, frequent vomiting, and hypotonia. Blood and urine citrulline are very high. What metabolic process is disturbed?

- A. Ornithine cycle
- B. Tricarboxylic acid cycle
- C. Glycolysis
- D. Gluconeogenesis
- E. Cori cycle

18. Patients with ischemic heart disease are usually prescribed small doses of aspirin. This drug inhibits synthesis of platelet aggregation

activator, thromboxane A<sub>2</sub>. What substance is this activator synthesized from?

- A. Arachidonic acid
- B. Malonic acid
- C. Acetic acid
- D. Homogentisic acid
- E. Glutamic acid

19. A patient with myocardial infarction in the acute phase has been hospitalized into the cardiology unit. To induce platelet lysis in the patient's coronary vessels during the early hours of infarction, the following enzyme should be used:

- A. Streptokinase
- B. Hyaluronidase
- C. Trypsin
- D. Chymotrypsin
- E. Lysozyme

20. In the hematology unit a patient with leukemia was prescribed 5-Fluorouracil. This drug:

- A. Inhibits DNA synthesis
- B. Stimulates DNase
- C. Inhibits translation
- D. Inhibits transcription
- E. Catalyzes replication

21. A 7-year-old boy is diagnosed with anemia. Laboratory analysis detects pyruvate kinase deficiency in his erythrocytes. What process is disturbed in this boy, playing the main role in anemia development in this case?

- A. Anaerobic glycolysis
- B. Deamination of amino acids
- C. Decarboxylation of amino acids
- D. Gluconeogenesis
- E. Anaerobic glycogenolysis

22. Examination of a patient shows decreased leukocyte and erythrocyte count and low hemoglobin levels in peripheral blood, as well as appearance of large cells (megaloblasts). What vitamin deficiency can cause these clinical presentations?

- A. Folic acid
- B. Niacin
- C. Ascorbic acid
- D. Riboflavin
- E. Biotin

23. Wernicke-Korsakoff syndrome often develops in chronic alcoholics, who have a low-vitamin diet. Decreased transketolase activity can be observed in the course of this disease. What vitamin deficiency causes this development?

- A. Thiamine
- B. Retinol
- C. Niacin
- D. Cobalamin
- E. Riboflavin

1. A patient was hospitalized in a comatose state. The patient has a 5-year-long history of diabetes mellitus type 2. Objectively respiration is noisy, deep, with acetone breath odor. Blood glucose is 15.2 mmol/L, ketone bodies - 100 micromol/L. These signs are characteristic of the following diabetes complication:

- A. Ketoacidotic coma
- B. Hepatic coma
- C. Hyperglycemic coma
- D. Hypoglycemic coma
- E. Hyperosmolar coma

2. A 63-year-old man suffers from esophageal carcinoma, presents with metastases into the mediastinal lymph nodes and cancerous cachexia. What pathogenetic stage of neoplastic process is observed in the patient?

- A. Progression
- B. Promotion
- C. Transformation
- D. Initiation
- E. -

3. After a prolonged attack of severe headache the patient lost mobility in his left arm and leg. Muscle tone is decreased in the affected limbs, the muscles are spasmed, spinal tendon reflexes are acutely intensified, reflex zones are increased. What nervous system disorder can be observed in this patient?

- A. Central paralysis
- B. Peripheral paralysis
- C. Extrapyramidal paralysis
- D. Flaccid paralysis
- E. Reflex paralysis

4. Hematologic study shows the following pattern: erythrocytes -  $2,8 \cdot 10^{12}/L$ , Hb - 80 g/L, color index - 0.85, reticulocytes - 0,1%, platelets - 160 thousand per microliter, leukocytes -  $60 \cdot 10^9/L$ . Basocytes - 2%, eosinophils - 8%, promyelocytes - 5%, myelocytes - 5%, juvenile - 16%, stab neutrophils - 20%, segmented neutrophils - 34%, lymphocytes - 5%, monocytes - 5%. This clinical presentation indicates the following blood pathology:

- A. Chronic myeloleukemia
- B. Acute myeloleukemia
- C. Hypoplastic anemia
- D. Undifferentiated leukemia
- E. Hemolytic anemia

5. Antileukocytic antibodies are detected in the blood of a patient with leukopenia. What type of Coombs-Gell hypersensitivity reaction developed in this case?

- A. Cytotoxic
- B. Stimulating
- C. Anaphylactic
- D. Delayed-type hypersensitivity
- E. Immune complex-mediated

6. A patient with obliterating endarteritis has undergone a ganglionic sympathectomy. Positive therapeutic effect of this surgery is associated with development of arterial hyperemia of the lower limbs, which can be described as:

- A. Neuroparalytic
- B. Neurotonic
- C. Metabolic
- D. Reactive
- E. Working

7. In an experiment a laboratory rat was subjected to a stress factor (electric current), which resulted in muscular hypotonia, arterial hypotension, hypothermia, and hypoglycemia in the animal. What period of general adaptation syndrome is it?

- A. Shock phase
- B. Antishock phase
- C. Resistance stage
- D. Exhaustion stage
- E. -

8. A 14-year-old adolescent has diphtheria. During the peak of the disease against the background of acute drop in body temperature and tachycardia the blood pressure is 70/50 mm Hg. What type of vascular tone disturbance is it?

- A. Acute hypotension
- B. -
- C. Chronic hypotension
- D. Somatoform autonomic dysfunction
- E. Essential hypotension

9. 24 hours after an appendectomy the patient's blood test shows neutrophilic leukocytosis with a regenerative shift. What is the most likely mechanism of absolute leukocytosis development in the patient's peripheral blood?

- A. Intensification of leukopoiesis
- B. Leukocyte redistribution
- C. Decreased leukocyte disintegration
- D. Deceleration of leukocyte migration to the tissues
- E. Immunity activation

10. A 59-year-old man, a business manager, developed intense burning retrosternal pain that irradiates to the left arm. The pain occurred in the evening after the tax audit. 15 minutes later the patient's condition normalized. What mechanism of angina pectoris development is leading in this patient?

- A. Increased level of blood catecholamines
- B. Coronary atherosclerosis
- C. Intravascular aggregation of blood cells
- D. Coronary artery thrombosis
- E. Functional cardiac overload

11. A 30-year-old person has been stung by a bee. The stung area exhibits edema, hyperemia, and elevated temperature. What is the initial pathogenetic factor of inflammatory edema in this case?

- A. Increase of microvascular permeability
- B. Increase of osmotic pressure in the inflammation focus
- C. Decrease of oncotic blood pressure
- D. Increase of capillary blood pressure
- E. Disturbed lymphatic efflux

12. A 30-year-old woman developed facial edemas. Examination detected proteinuria (5.87 g/L), hypoproteinemia, dysproteinemia, and hyperlipidemia. Such combination of signs is characteristic of:

- A. Nephrotic syndrome
- B. Nephritic syndrome
- C. Chronic pyelonephritis
- D. Acute kidney failure
- E. Chronic kidney failure

13. An unconscious young man in the state of morphine intoxication has been brought into an admission room. The patient's respiration is slow and shallow due to suppression of the respiratory center. What kind of respiratory failure occurred in this case?

- A. Ventilatory disregulation
- B. Ventilatory obstruction
- C. Ventilatory restriction
- D. Perfusion
- E. Diffusion

14. A man has been working for a long time in oil processing. What type of carcinogens does he encounter at his workplace?

- A. Polycyclic aromatic hydrocarbons
- B. Amino-azo compounds
- C. Nitrosamines
- D. Biological carcinogens
- E. Amines

15. A patient has been suffering from bronchial asthma for 15 years. What changes in the patient's leukogram can be expected in this case?

- A. Eosinophilia
- B. Basophilia
- C. Leukocytosis
- D. Leukopenia
- E. Left shift

16. A married couple came for a genetic counseling. The husband suffers from insulin-independent diabetes mellitus, while the

wife is healthy. What is the probability of their child developing insulin-independent diabetes mellitus?

- A. Higher than in the population
- B. The same as in the population
- C. Lower than in the population
- D. 100%
- E. 50%

17. A laboratory rat with chronic kidney failure presents with osteoporosis, pathologic calcification of the internal organs, and arterial hypertension. These disturbances are associated with increased activity of the following hormone:

- A. Parathyroid hormone
- B. Thyroxin
- C. Triiodothyronine
- D. Calcitonin
- E. Adrenaline

18. A patient is diagnosed with severe  $B_{12}$ -deficiency anemia resulting in disturbed hematopoiesis and appearance of atypical erythrocytes in the blood. The patient has a history of total gastric resection. This diagnosis can be confirmed if the following cells are present in the peripheral blood:

- A. Megalocytes
- B. Microcytes
- C. Elliptocytes
- D. Normocytes
- E. Anulocytes

19. A patient with asphyxia after a brief respiratory arrest developed single infrequent respirations with passive expiration, after which he stopped breathing completely. What type of respiration was observed in this case?

- A. Gasping respiration
- B. Apneustic respiration
- C. Kussmaul respiration
- D. Cheyne-Stokes respiration
- E. Biot respiration

20. A 3-year-old child has been brought by ambulance to the intensive care unit of the infectious diseases hospital. On examination the child is in severe condition, skin and mucosa are dry, tissue turgor is reduced. The patient's history states that profuse diarrhea and recurrent vomiting were observed throughout the previous day after the child had eaten food products of poor quality. What type of salt and water imbalance is likely to have developed in the patient?

- A. Hypoosmolar dehydration
- B. Isoosmolar dehydration
- C. Hyperosmolar hyperhydration
- D. Isoosmolar hyperhydration
- E. Hypoosmolar hyperhydration

**21.** A 48-year-old man is unconscious. He has a history of several syncopal episodes with convulsions. ECG shows deformed QRS complexes unconnected with P waves, atrial contractions are approximately 70/min., ventricular contractions - 25-30/min. Name the type of arrhythmia in this case:

- A.** Complete atrioventricular block
- B.** First-degree atrioventricular block
- C.** Second-degree atrioventricular block
- D.** Intraatrial block
- E.** Intraventricular block

**22.** A 40-year-old man with impaired venous patency in the lower limbs developed edemas. What mechanism plays the main role in the development of this disturbance?

- A.** Elevated filtration pressure
- B.** Positive fluid balance
- C.** Decreased gradient of osmotic pressure between blood and tissue
- D.** Disturbed humoral regulation of water-mineral balance
- E.** Hypoproteinemia

1. Autopsy of a 60-year-old woman, who for a long time had been suffering from essential hypertension, shows significantly diminished kidneys (weight of both kidneys is 80 g) with finely granular surface. Uniform renal cortical thinning can be observed on section. Name the described changes in the kidneys:

- A. Primary contracted kidney
- B. Pyelonephritic contracted kidney
- C. Secondary contracted kidney
- D. Amyloid contracted kidney
- E. Diabetic nephrosclerosis

2. Autopsy of a 3-year-old child shows a tumor in the cerebellum. The tumor has no clear margins separating it from the surrounding tissues. Histologically it is made of small atypical cells with hyperchromic nuclei. This tumor is most likely a:

- A. Medulloblastoma
- B. Medullary sarcoma
- C. Cancer metastasis
- D. Sarcoma metastasis
- E. Glioblastoma

3. Autopsy revealed a large wedge-shaped patch of a dense dark red tissue with clear margins in the upper lobe of the right lung. Histological examination detected there necrosis of the alveolar walls; the alveolar lumen is tightly packed with erythrocytes. What process occurred in the lungs?

- A. Hemorrhagic infarction
- B. Carneous degeneration
- C. Gangrene
- D. Hemorrhage
- E. Atelectasis

4. Regional lymph nodes surrounding an infected wound are enlarged. Histological examination shows increased number of macrophages, lymphocytes, and lymphatic follicles in the cortical layer of the lymph nodes, as well as a large amount of plasma cells. What process in the lymph nodes is indicated by these histological changes?

- A. Antigen stimulation
- B. Acquired deficiency of lymphoid tissue
- C. Congenital deficiency of lymphoid tissue
- D. Neoplastic aberration
- E. Transplant rejection

5. A patient has gradually developed a skin plaque on his face. In the center of this plaque there are necrotic patch and an ulcer. Histopathological analysis of the biopsy material reveals proliferation of atypical epithelial cells with large number of pathologic mitoses. What is the most likely diagnosis?

- A. Skin cancer
- B. Sarcoma
- C. Papilloma
- D. Trophic ulcer
- E. Fibroma

6. Histological analysis of a biopsy skin sample obtained from a 24-year-old patient detects caseous necrosis surrounded with cellular infiltrate consisting of lymphocytes, among which there are single giant cells; proliferation of connective tissue and endovasculites are observed. Characterize this pathologic process:

- A. Proliferative granulomatous inflammation
- B. Proliferative interstitial inflammation
- C. Abscess
- D. Catarrhal inflammation
- E. Ichorous inflammation

7. Autopsy of a man, who had been suffering from mitral stenosis, reveals dense brown lungs. What pathologic process had occurred in the lungs?

- A. Hemosiderosis
- B. Hemochromatosis
- C. Jaundice
- D. Hemomelanosis
- E. Lipofuscinosis

8. A 63-year-old man, who has been suffering from chronic diffuse obstructive pulmonary emphysema for 15 years, died of progressive heart failure. Autopsy shows nutmeg liver cirrhosis, cyanotic induration of kidneys and spleen, ascites, and edemas of the lower limbs. What type of heart failure can be characterized by such changes in the internal organs?

- A. Chronic heart failure
- B. Acute right ventricular failure
- C. Chronic atrial failure
- D. Acute left ventricular failure
- E. Acute global heart failure

9. A 6-year-old girl presents with acute onset of a disease. She developed sore throat and high temperature that were later accompanied by a punctate skin rash. Oral examination reveals acute pharyngeal hyperemia, raspberry tongue, and enlarged bright red tonsils with dull gray and yellow foci that spread to the peritonsillar tissues. The submandibular lymph nodes are enlarged. What disease are these changes characteristic of?

- A. Scarlet fever
- B. Measles
- C. Pharyngeal diphtheria
- D. Laryngeal diphtheria
- E. Meningococcal nasopharyngitis

10. Autopsy of a man, who served on a nuclear submarine, revealed the

following pathologies: bone marrow atrophy (panmyelophthisis), anemia, leukopenia, thrombocytopenia, lymphocytic disintegration in the lymph nodes, spleen, gastrointestinal lymphatic system, and hemorrhages into the adrenal glands. What disease had developed in this case?

- A. Acute radiation sickness
- B. Decompression sickness
- C. Acute leukemia
- D. Acute anemia
- E. Vibration disease

11. A 9-month-old child presents with delayed tooth eruption, improper sequence of tooth eruption, and horizontal maxillary configuration (high-arched palate). Microscopically enamel mineralization pattern is irregular, enamel columns are wrinkled, some of them are vacuolated, predentin zones are widened, single denticles can be observed. What disease is it?

- A. Early rickets
- B. Late rickets
- C. Osteomalacia
- D. Gout
- E. Hypervitaminosis D

12. Autopsy of a 58-year-old man, who for a long time has been drinking alcohol in large amounts and died at home, is being conducted. Macroscopically the right lung is dense and enlarged, its tissue is gray and homogeneous on section, its pleura is covered with grayish membranous deposits. Microscopically the alveolar cavities contain fibrin threads, neutrophils, and hemolysed erythrocytes. Make the diagnosis:

- A. Croupous pneumonia
- B. Focal pneumonia
- C. Interstitial pneumonia
- D. Primary pulmonary tuberculosis
- E. Caseous pneumonia

13. Autopsy of a 49-year-old woman who died of chronic kidney failure shows small dense striated kidneys with areas of hemorrhages. Microscopically nuclei of epithelial channels contain hematoxylin bodies; glomerular capillaries resemble wire loops, have thickened basement membranes, and in places contain hyaline thrombi and foci of fibrinoid necrosis. What is the most likely diagnosis?

- A. Systemic lupus erythematosus
- B. Rheumatism
- C. Arteriolosclerotic nephrosclerosis
- D. Amyloidosis
- E. Atherosclerotic nephrosclerosis

14. A 34-year-old man died in a comatose state. According to his family after a business

trip to an African country he developed periodical jaundice attacks. Autopsy shows the following: dense enlarged spleen with slate-black pulp; enlarged plethoric liver, gray-black on section; cerebral gray matter is brown-gray; cerebral white matter contains numerous small hemorrhages. What infectious disease can be suspected?

- A. Malaria
- B. Meningococemia
- C. Prion infection
- D. Generalized herpetic infection
- E. Generalized cryptococcosis

15. A 27-year-old woman has undergone a sector resection of mammary gland tissue. Macroscopy detects a dense white node, 4 cm in diameter, with clear margins in the excised tissue. Immediate histological analysis shows the tumor to consist of a large amount of fibrous stroma with stromal proliferation around the small canaliculi. Canalicular epithelium overlays the basement membrane and retains its polarity. Make the diagnosis:

- A. Pericanalicular fibroadenoma
- B. Adenocarcinoma
- C. Sarcoma
- D. Dyshormonal disorders
- E. Cancer

16. In the course of an urgent surgery, the vermiform appendix of the patient was excised. The appendix was acutely distended and gray-black throughout its whole length. In the distal segment a defect of the appendix wall was detected, through which a foul-smelling gray-brown substance was being discharged from the appendix lumen. Histological analysis shows necrotization of the appendix wall with hemorrhagic foci; lumen of the mesenteric artery is filled with a thrombus. What type of appendicitis is it?

- A. Acute gangrenous
- B. Acute phlegmonous
- C. Acute simple
- D. Acute superficial
- E. Chronic

17. A 39-year-old man underwent a surgery for peptic ulcer disease of the stomach. He died 7 days after the surgery. On autopsy the peritoneal layers are plethoric, dull, and covered with massive yellow-green membranous deposits. The peritoneal cavity contains approximately 300 mL of thick yellow-green fluid. What pathologic process was detected in the peritoneal cavity?

- A. Fibrinopurulent peritonitis
- B. Serous peritonitis
- C. Serofibrinous peritonitis
- D. Peritoneal commissures
- E. Fibrinohemorrhagic peritonitis

1. To test donor blood for hepatitis B antigens, it is necessary to use highly sensitive detection methods. What test should be used for this purpose?

- A. Solid-phase enzyme-linked immunosorbent assay
- B. Immuno-electrophoresis
- C. Indirect hemagglutination
- D. Complement binding
- E. Indirect immunofluorescence

2. The bacteriological laboratory has received for analysis a sample of dried fish from a focus of food poisoning outbreak. The bacteriologist inoculated the sample into a Kitt-Tarozzi medium, where growth of tennis racquet-shaped microorganisms could be observed. These microorganisms are likely to be the causative agents of:

- A. Botulism
- B. Salmonellosis
- C. Dysentery
- D. Staphylococcal toxicoinfection
- E. Typhoid fever

3. To determine toxigenicity of diphtheria causative agents obtained from patients, the cultures were inoculated in a Petri dish with nutrient agar, bilaterally to a strip of filter paper spotted with antidiphtheric antitoxic serum and situated in the center of the Petri dish. After incubation of the inoculated cultures in the agar, strip-like areas of medium turbidity formed between some of the cultures and the filter paper. What immunological test was conducted?

- A. Agar gel precipitation test
- B. Coombs test
- C. Agglutination test
- D. Ring precipitin test
- E. Opsonization test

4. The bacteriological laboratory needs to prepare for analysis of materials that are suspected to be contaminated with spores of anthrax causative agent. What diagnostic preparation allows for quick detection of these spores?

- A. Anti-anthrax fluorescent serum
- B. Anti-anthrax immunoglobulin
- C. Standard anthrax antigen
- D. Enzyme-tagged immunoglobulin
- E. Monoclonal antibodies to anthrax causative agent

5. A family has two children. The younger child is under a year. The child has developed spastic cough attacks. Similar clinical presentation was observed in the elder preschool child one month ago. The doctor suspects pertussis infection. What method enables retrospective diagnostics of this disease?

- A. Serological
- B. Bacteriological
- C. Biological
- D. Microscopy
- E. Molecular biological

6. What diagnostic method should be used in industry to test the raw leather for presence of *B. anthracis*?

- A. Ascoli's thermo precipitation test
- B. Microscopy with Burry-Gins stain
- C. Microscopy with Aujeszky stain
- D. Bacteriological analysis
- E. Serological test

7. Urinalysis of a patient with acute cystitis shows leukocytes and a large number of gram-negative bacilli. Inoculation has resulted in the growth of mucous colonies that produce a green soluble pigment. What microorganism is the most likely cause of the patient's disorder?

- A. *Pseudomonas aeruginosa*
- B. *Escherichia coli*
- C. *Klebsiella pneumoniae*
- D. *Proteus mirabilis*
- E. *Salmonella enteritidis*

8. Pathologic material (mucosal excretion from the nasal passages) obtained from a patient provisionally diagnosed with influenza was sent to the virological laboratory. What quick test allows detecting specific viral antigen in the investigated material?

- A. Direct and indirect immunofluorescence (IF)
- B. Direct and indirect enzyme-linked immunosorbent assay (ELISA)
- C. Hemagglutination inhibition assay (HAI)
- D. Reverse indirect hemagglutination (RIHA)
- E. Radioimmunoassay (RIA)

9. First-year schoolchildren have received tuberculin skin test (Mantoux test) at the school nurse's office. The purpose of this test was:

- A. To determine the children that need to receive BCG vaccination
- B. To preventively vaccinate against tuberculosis
- C. To measure immunity stress due to diphtheria
- D. To measure allergization rate against rickettsia
- E. To detect parotitis in the schoolchildren

10. A 12-year-old boy with clinical presentation of influenza has developed respiratory mycoplasmosis. What type of infection has developed under these conditions?

- A. Mixed infection
- B. Iatrogenic infection
- C. Superinfection
- D. Relapse
- E. Autoinfection

1. A patient with peptic ulcer disease was prescribed famotidine. As a result his gastric juice acidity significantly decreased. What is the mechanism of action of this drug?

- A. Histamine H<sub>2</sub> receptor blockade
- B. Histamine H<sub>1</sub> receptor blockade
- C. Muscarinic M<sub>1</sub> receptor blockade
- D. Inhibition of H<sup>+</sup>, K<sup>+</sup>-ATPase activity
- E. Blockade of histamine receptors in the sympathetic ganglia

2. A 33-year-old woman, who for a long time has been treated for chronic polyarthritis, complains of elevated blood pressure, changes in adipose tissue distribution, and disturbed menstrual cycle. What drug does this patient take?

- A. Prednisolone
- B. Indometacin
- C. Butadion (Phenylbutazone)
- D. Synaflan (Fluocinolone acetonide)
- E. Beclometasone

3. The first-aid center has received a victim of a traffic accident diagnosed with closed displaced fracture of the middle third of the thigh. For repositioning of the bone fragments the patient received 10 mL of 2% dithylinum solution intravenously, which resulted in the prolonged period of apnoea and muscle relaxation. What enzyme is deficient, resulting in such pharmacogenetic enzymopathy?

- A. Pseudocholinesterase
- B. Uridine diphosphate glucuronyltransferase
- C. Glucose 6-phosphate dehydrogenase
- D. Methemoglobin reductase
- E. N-acetyltransferase

4. A patient with diabetes mellitus and allergic dermatitis was prescribed a certain fluorinated hormone drug in the ointment dosage form. When the patient asked, how this drug was better than the hydrocortisone ointment, the doctor explained that the prescribed medicine:

- A. Had practically no resorptive effect
- B. Increased insulin synthesis
- C. Had short-term action
- D. Was less potent
- E. Was cheaper

5. A 45-year-old woman has an attack of cardiac fibrillation. She suffers from stage II essential hypertension. What is the drug of choice for stopping this attack?

- A. Anaprilin (Propranolol)
- B. Sustac forte (Nitroglycerin)
- C. Potassium chloride
- D. Strophanthin
- E. Lidocaine

6. A patient with inoperable lung cancer accompanied by unbearable pain was prescribed an analgesic. Against the background of analgesic therapy the patient developed signs of intestinal obstruction. What analgesic could have caused this complication?

- A. Morphine
- B. Promedol (Trimeperidine)
- C. Omnopon (Papaveretum)
- D. Fentanyl
- E. Analgin (Metamizole)

7. A patient has been taking bisacodyl for a long time to treat chronic constipation. However, several weeks later the aperient effect of the drug diminished. What is the possible cause of this?

- A. Acquired tolerance
- B. Drug dependence
- C. Material cumulation
- D. Functional cumulation
- E. Sensitization

8. A 39-year-old man presents with hyperkeratosis, disturbed twilight vision, and high risk of infectious processes. What vitamin preparation should he be prescribed?

- A. Retinol acetate
- B. Pyridoxine hydrochloride
- C. Riboflavin
- D. Ergocalciferol
- E. Tocopherol acetate

9. The neurological department received a patient complaining of memory deterioration and loss of mental work capacity that developed after a head trauma. Recommend him a medicine for improvement in cerebral metabolism:

- A. Piracetam (Nootropil)
- B. Meridil (Methylphenidate)
- C. Sydnocarb (Mesocarb)
- D. Caffeine
- E. Analgin (Metamizole)

10. A woman with polyarticular rheumatoid arthritis was prescribed a non-steroidal anti-inflammatory drug - diclofenac sodium. After the patient has been taking it for some time, her concomitant disease exacerbated, which forced the doctor to cancel the prescription of this drug. What concomitant disease could necessitate cancellation of this drug prescription?

- A. Ulcer disease
- B. Ischemic heart disease
- C. Diabetes mellitus
- D. Essential hypertension
- E. Bronchial asthma

11. A patient with streptococcal infection



of the gingiva was prescribed a drug with  $\beta$ -lactam ring in its structure. What drug of those listed below belongs to this pharmacological group?

- A. Benzylpenicillin
- B. Rifampicin
- C. Erythromycin
- D. Streptomycin sulfate
- E. Levomycetin (Chloramphenicol)

12. A patient was administered a certain drug for relief of cardiac rhythm disturbance. This drug can be used as a local anesthetic as well. Name this drug:

- A. Lidocaine hydrochloride
- B. Dicain (Tetracaine)
- C. Diphenine (Phenytoin)
- D. Cocaine hydrochloride
- E. Anaesthesin (Benzocaine)

13. A patient with arrhythmia was hospitalized into the cardiology unit. What antiarrhythmic drug should be prescribed?

- A. Amiodarone
- B. Acetylsalicylic acid
- C. Drotaverine hydrochloride
- D. Furacilin (Nitrofuril)
- E. Diclofenac sodium

14. A woman with allergic neurodermatitis was prescribed a second-generation antihistamine without depressing effect on the CNS. Name this drug:

- A. Loratadine
- B. Diazolin (Mebhydrolin)
- C. Tavegil (Clemastine)
- D. Dimedrol (Diphenhydramine)
- E. Ketotifen

15. During gastric resection the patient received mixed anesthesia with tubocurarin chloride muscle relaxant; to restore

spontaneous respiration the patient received proserin. What pharmacological group does this drug belong to?

- A. Cholinesterase inhibitors
- B. Angiotensin-converting-enzyme inhibitors
- C. Calcium channel blockers
- D. Muscarinic antagonists
- E. Muscarinic agonists

16. To treat the burns, a patient was prescribed a drug with antiseptic properties that are based on formation of atomic oxygen in the presence of organic substances. This drug has also an astringent (anti-inflammatory) effect due to formation of albuminates. Name this drug:

- A. Potassium permanganate
- B. Ethyl alcohol
- C. Sodium bicarbonate
- D. Hydrogen peroxide
- E. Chlorhexidine digluconate

17. Before a surgery the patient was prescribed a synthetic antiprotozoal drug for prevention of wound infection. The prescribed drug is highly effective against *Helicobacter pylori*. Name this drug:

- A. Metronidazole
- B. Doxycycline hydrochloride
- C. Chingamin (Chloroquine)
- D. Aciclovir
- E. Isoniazid

18. A patient with essential hypertension was prescribed a drug that inhibits angiotensin-converting enzyme (ACE). What drug is it?

- A. Lisinopril
- B. Losartan
- C. Nifedipine
- D. Colestyramine
- E. Carvedilol