



**STATE NON-PROFIT ENTERPRISE  
«TESTING BOARD FOR PROFESSIONAL COMPETENCE ASSESSMENT OF  
HIGHER EDUCATION TRAINEES IN MEDICINE AND PHARMACY AT THE  
MINISTRY OF HEALTH OF UKRAINE»**

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Variant 49

**TEST ITEMS  
FOR THE UNIFIED STATE QUALIFICATION EXAM  
TEST COMPONENT  
STAGE 1**

**MEDICINE**

**KROK 1**

1. A patient has dysfunction of masticatory muscles, caused by damage to the trigeminal motor nucleus. What part of the brain is damaged in this case?

- A. Diencephalon
- B. Mesencephalon
- C. Pons
- D. Medulla oblongata
- E. Cerebellum

2. A patient diagnosed with chronic glomerulonephritis developed persistent arterial hypertension. What group of drugs should be used for the treatment of this patient?

- A.  $\alpha$ -blockers
- B. Ganglionic blockers
- C. Calcium antagonists
- D. Myotropic antispasmodics
- E. Angiotensin-converting enzyme inhibitors

3. 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. Y-linked
- C. X-linked recessive
- D. Autosomal dominant
- E. X-linked dominant

4. A patient presents with a purulent inflammatory process in the thigh region (a post-injection abscess). What lymph nodes become enlarged because of this process?

- A. Inguinal
- B. Popliteal
- C. Paratracheal
- D. Posterior cervical
- E. Submandibular

5. A patient was hospitalized with complaints of periodic attacks of palpitations that pass on their own. ECG detected an episode of contractions with the rate of 200/min. and the following characteristics: regular rhythm, no P wave, unchanged QRS complex, deformed T wave. What type of arrhythmia is it?

- A. Ventricular extrasystole
- B. First-degree AV block
- C. Atrial extrasystole
- D. Complete AV block
- E. Paroxysmal supraventricular tachycardia

6. Examination of a patient shows decreased leukocyte and erythrocyte

count and low hemoglobin levels in the peripheral blood, as well as appearance of large cells (megaloblasts). What vitamin is likely to be deficient in this case, causing this condition?

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

7. What internal organ plays the largest role in humoral regulation of erythropoiesis?

- A. Lungs
- B. Kidneys
- C. Liver
- D. Pancreas
- E. Gastrointestinal tract

8. A 49-year-old patient complains of persistently elevated blood pressure (155/120 mm Hg). The recommended hypotensive therapy, lasting for a month, was ineffective. Additional examination detected hypernatremia, hypochloremia, and adrenal hyperplasia. The diagnosis of primary hyperaldosteronism was made. Because surgical treatment was impossible in this case, the patient was recommended a pharmacological therapy with a mineralocorticoid receptor antagonist. What drug was recommended for the patient?

- A. Spironolactone
- B. Captopril
- C. Metoprolol
- D. Losartan
- E. Amlodipine

9. Laboratory diagnostics of hepatitis B has determined the presence of viral DNA in the patient's blood. What reaction is usually used for this purpose?

- A. Enzyme-linked immunosorbent assay
- B. Complement fixation test
- C. Hemagglutination inhibition test
- D. Polymerase chain reaction
- E. Indirect hemagglutination test

10. A 15-year-old patient complains of general weakness, dizziness, and rapid fatigability. Examination detects changed shape of erythrocytes and reduced erythrocyte count. A provisional diagnosis of sickle cell anemia was made. What amino acid replacement occurs in hemoglobin, causing the development of this pathological condition?



- A. Valine becomes replaced with aspartate
- B. Glutamate becomes replaced with aspartate
- C. Glutamate becomes replaced with valine
- D. Valine becomes replaced with glutamate
- E. Glutamate becomes replaced with alanine

11. In the nucleus of a cell, a molecule of mature mRNA, which is smaller in size, was formed from a larger molecule of immature mRNA. The stages of this transformation together are called:

- A. Replication
- B. Translation
- C. Processing
- D. Recognition
- E. Termination

12. A patient had her tooth extracted in a dental clinic. Stratified squamous epithelium regenerated two weeks later. What organelles took part in the restoration of the mucosa?

- A. Smooth endoplasmic reticulum
- B. Ribosomes
- C. Postlysosomes
- D. Centrosomes
- E. Mitochondria

13. An anti-inflammatory drug that blocks cyclooxygenase activity was used in the treatment of a patient. What anti-inflammatory drug is it?

- A. Thiamine
- B. Allopurinol
- C. Analgin (Metamizole sodium)
- D. Creatine
- E. Aspirin (Acetylsalicylic acid)

14. A patient with bronchopulmonary aspergillosis developed allergic rhinitis. Enzyme-linked immunosorbent assay detects elevated levels of IgE. What cell type expresses receptors for IgE on its cell surface, which stimulates the cell to respond to parasites, such as worms?

- A. NK cells
- B. Mast cells
- C. Promonocytes
- D. B cells
- E. T cells

15. After the treatment with an antitubercular agent, a 40-year-old woman developed optic neuritis, memory impairment, and seizures. What medicine was she taking?

- A. Rifampicin
- B. Kanamycin
- C. Thioacetazone
- D. Isoniazid
- E. Para-aminosalicylic acid

16. A repeated Widal agglutination test shows an increase from 1:100 to 1:400 in the titers of antibodies to *S. typhi* O-antigens in the patient's serum. How can the obtained results be interpreted?

- A. The patient was previously vaccinated against typhoid fever
- B. The patient is a chronic carrier of typhoid microbes
- C. The patient has a past history of typhoid fever
- D. The patient has typhoid fever
- E. The patient is an acute carrier of typhoid microbes

17. Bioactive substances hormones are produced as a result of hydrolysis and modification of certain proteins. What protein in the pituitary gland is the source of lipotropin, corticotropin, melanotropin, and endorphin?

- A. Neurostromin
- B. Proopiomelanocortin (POMC)
- C. Neuroalbumin
- D. Thyroglobulin
- E. Neuroglobulin

18. In a patient with hypochromic anemia, erythrocytes contain 45% of HbS and 55% of HbA1. What type of anemia is it?

- A. Addison-Biermer disease
- B. Microspherocytic anemia
- C.  $\alpha$ -thalassemia
- D. Glucose-6-phosphate dehydrogenase deficiency anemia
- E. Sickle cell anemia

19. A patient has been diagnosed with hydrocele testis (an increase in the amount of fluid in a serous cavity). Between what testicular tunics can the pathological content be located in this case?

- A. Between the parietal and visceral laminae of the tunica vaginalis of the testicle
- B. Between the skin and tunica dartos
- C. Between the tunica dartos and internal spermatic fascia
- D. Between the internal spermatic fascia and tunica vaginalis of the testicle
- E. Between the skin and cremaster muscle

20. A 7-year-old child was diagnosed with anemia. Laboratory testing detects pyruvate kinase deficiency in the

erythrocytes. What process is disturbed in this case, playing the main role in the anemia development?

- A. Gluconeogenesis
- B. Anaerobic glycogenolysis
- C. Amino acid decarboxylation
- D. Anaerobic glycolysis
- E. Amino acid deamination

21. A man was hospitalized with abdominal pain and profuse salivation, sweating, and tears. Examination detects miosis. The day before, he was treating plants with a solution of an insecticidal substance without wearing personal protective equipment. The substance that has caused the poisoning in this case belongs to:

- A. Copper salts
- B. Organochlorine compounds
- C. Anticholinesterase agents
- D. Nitrates
- E. Nicotinic cholinomimetics

22. The study of a blood smear obtained from a patient with an inflammatory process detects a large number of round cells with a segmented nucleus (three or more segments) and fine pink-violet granulation in the cytoplasm. What blood cells were detected?

- A. Erythrocytes
- B. Neutrophilic granulocytes
- C. Lymphocytes
- D. Basophilic granulocytes
- E. Eosinophilic granulocytes

23. After falling from a tree, a person has problems with extending an arm into a horizontal position. What muscle most likely has been injured in this case?

- A. *M. anconeus*
- B. *M. supinator*
- C. *M. deltoideus*
- D. *M. triceps brachii*
- E. *M. coracobrachialis*

24. A 43-year-old patient, who had been suffering from tuberculosis for a long time, developed bleeding from the lungs, which resulted in the patient's death. Autopsy detected several oval and round cavities in the lungs. The walls of the cavities were formed by necrotic masses and lung tissue. What form of tuberculosis can be characterized by these pathological changes?

- A. Fibrocavitary tuberculosis
- B. Acute cavernous tuberculosis
- C. Acute focal tuberculosis
- D. Tuberculoma
- E. Caseous pneumonia

25. Copper deficiency has an effect on energy metabolism in the human body. What substance becomes deficient as a result of this process?

- A. Cytochrome oxidase
- B. Pyruvate carboxylase
- C. Lactate dehydrogenase
- D. Arginase
- E. Succinate dehydrogenase

26. In adipocytes of adipose tissue, the pentose-phosphate pathway has the nature of a cycle. What is the main function of this cycle in adipose tissue?

- A. Neutralization of xenobiotics
- B. Energy generation
- C. Oxidation of glucose to end products
- D. Generation of NADPH<sub>2</sub>
- E. Production of ribose phosphates

27. A doctor suspects diphtheria in a patient. Bacterioscopy of a throat swab detected rod-shaped bacteria with volutin granules. What etiologic drug would be the drug of choice in this case?

- A. Antidiphtheric antitoxic serum
- B. Bacteriophage
- C. Interferon
- D. Diphtheria toxoid
- E. Eubiotic

28. A patient with a suspected systemic disease underwent a biopsy of an area of increased density and immobility in the skin. In the dermis, the study detected all types of connective tissue disorganization with a weak cellular reaction, gross sclerosis, and hyalinosis. What disease can be characterized by these pathological changes?

- A. Scleroderma
- B. Polyarteritis nodosa
- C. Dermatofibroma
- D. Psoriasis
- E. Systemic lupus erythematosus

29. Autopsy of the body of a man who died of croupous pneumonia revealed an opaque liquid in the pleural cavity and a grayish film on the visceral pleura. What type of inflammation is observed on the visceral pleura?



- A. Granulomatous
- B. Purulent
- C. Hemorrhagic
- D. Catarrhal
- E. Fibrinous

30. During a surgery for gallstones in bile ducts, the surgeon must find the common hepatic duct. It is located between the layers of the following ligament:

- A. Round ligament of the liver
- B. Hepatoduodenal ligament
- C. Ligamentum venosum
- D. Hepatogastric ligament
- E. Hepatorenal ligament

31. A patient has been prescribed pyridoxal phosphate. This drug is recommended for correction of the following processes:

- A. Oxidative decarboxylation of keto acids
- B. Deamination of purine nucleotides
- C. Protein synthesis
- D. Transamination and decarboxylation of amino acids
- E. Synthesis of purine and pyrimidine bases

32. Microscopy of the kidney biopsy material detected foci with granular eosinophilic masses in their center, surrounded by an infiltrate consisting of lymphocytes, epithelioid cells, and isolated Langhans cells. What pathological process corresponds with the described changes?

- A. Granulomatous inflammation
- B. Alterative inflammation
- C. Coagulative necrosis
- D. Proliferation and differentiation of macrophages
- E. Caseous necrosis

33. Examination detects a dysfunction of the nodes in the patient's cardiac conduction system. In this case, blood circulation disorders have occurred in the basin of the following artery:

- A. Right coronary artery
- B. Left coronary artery
- C. Circumflex branch of the left coronary artery
- D. Right and left coronary arteries
- E. Anterior interventricular branch of the left coronary artery

34. A 45-year-old man with acute pneumonia was prescribed a penicillin antibiotic. However, when tested for personal tolerance to this antibiotic, he developed an allergic response. What drug should be prescribed for treatment in this case?

- A. Benzylpenicillin
- B. Phenoxymethylpenicillin
- C. Erythromycin
- D. Bicillin-5
- E. Ciprofloxacin

35. A 10-year-old child underwent a Mantoux test (with tuberculin). After 48 hours, a papule up to 8 mm in diameter appeared at the site of tuberculin injection. What type of hypersensitivity reaction developed after administration of tuberculin?

- A. Type IV hypersensitivity reaction
- B. Arthus reaction
- C. Atopic reaction
- D. Type II hypersensitivity reaction
- E. Serum sickness

36. A 64-year-old woman has suffered a pathological fracture of the humerus. Biopsy detects atypical plasma cells. X-ray shows tumor-like formations at the fracture site. What disease is likely in this case?

- A. Fibrous dysplasia of bone
- B. Chondrosarcoma
- C. Myeloma disease
- D. Chronic osteomyelitis
- E. Adenocarcinoma metastasis

37. All nonsteroidal anti-inflammatory drugs can damage the gastric mucosa. To find the substances that do not cause this complication, it is necessary to know what it is associated with. To reduce the severity of this complication, the drug's effect on a certain molecular substrate must be reduced. Name this molecular substrate.

- A. Lysosomal enzymes
- B. Kallikrein
- C. Cyclooxygenase-2
- D. Adenylate cyclase
- E. Cyclooxygenase-1

38. A patient with leukemia was prescribed 5-fluorouracil. What is the mechanism of action of this drug?

- A. DNase stimulation
- B. DNA synthesis inhibition
- C. Translation inhibition
- D. Transcription inhibition
- E. Replication catalysis

39. Five days after a diarrhea onset, colonoscopy detected gray-green filmy deposits tightly attached to the underlying tissue in the inflamed rectal mucosa of the patient. What disease can be characterized by these pathological changes?



- A. Typhoid fever
- B. Crohn's disease
- C. Salmonellosis
- D. Nonspecific ulcerative colitis
- E. Dysentery

40. A patient diagnosed with diabetes mellitus presents with increased levels of ketone bodies in the blood. From what compound are ketone bodies synthesized?

- A. Acyl-CoA
- B. Succinyl-CoA
- C. Acetyl-CoA
- D. Butyryl-CoA
- E. Oxyacyl-CoA

41. A group of alpinists, who were climbing to the altitude of 5000 meters above sea level without oxygen equipment, developed tachycardia, decreased blood pressure, and rapid breathing. What hypoxia developed in the mountain climbers?

- A. Hypoxemic hypoxia
- B. Respiratory hypoxia
- C. Hemic hypoxia
- D. Tissue hypoxia
- E. Circulatory hypoxia

42. A patient has an abscess in the left inguinal region. The patient developed complaints of general weakness, fever that in the evening reaches  $38.5^{\circ}\text{C}$  and normalizes in the morning, and painful red skin in the area of abscess localization. What type of temperature curve can be observed in this patient?

- A. *Febris acontinua*
- B. *Febris recurrens*
- C. *Febris remittens*
- D. *Febris hectica*
- E. *Febris continua*

43. The course of hemorrhagic shock was complicated by the development of acute renal failure in the patient. What is the initiating link in the mechanism of development of this complication?

- A. Development of DIC syndrome
- B. Activation of the sympathoadrenal system
- C. Release of vasopressin into the blood
- D. Increased permeability of the capillary wall
- E. Centralization of blood circulation with development of renal ischemia

44. Autopsy of the body of a 1.5-year-old child revealed a hemorrhagic skin rash, moderate hyperemia and edema of the nasopharyngeal mucosa, small

hemorrhages in the mucosa and internal organs, markedly dystrophic changes in the liver and myocardium, acute necrotizing nephrosis, and massive hemorrhages in the adrenal glands. These changes are characteristic of the following disease:

- A. Meningococcal infection
- B. Diphtheria
- C. Scarlet fever
- D. Epidemic typhus
- E. Measles

45. A patient diagnosed with essential hypertension died of an acute myocardial infarction. Autopsy revealed a cavity 2 cm in diameter in the right hemisphere of the brain. The cavity is filled with a transparent yellowish liquid. The wall of the cavity is rusty yellow and smooth. What pathology was detected in the brain of the deceased?

- A. —
- B. Echinococcus
- C. Abscess
- D. Tuberculosis
- E. Cyst

46. Examination has detected a polyp in the distal part of the patient's large intestine. What is the localization of the polyp?

- A. *Caecum*
- B. *Colon transversum*
- C. *Colon sigmoideum*
- D. *Colon descendens*
- E. *Rectum*

47. A person entered a room with increased levels of carbon dioxide in the air. How will the breathing of this person change?

- A. Respiration rate and depth will increase
- B. Respiration depth will decrease
- C. Respiration rate will decrease
- D. Respiration depth will increase
- E. Respiration rate will increase

48. At a medical genetic consultancy, the karyotype of a child with physical development problems was examined. Trisomy 13 was detected. What syndrome is it?

- A. Klinefelter syndrome
- B. Patau syndrome
- C. Turner syndrome
- D. Edwards syndrome
- E. Down syndrome

49. A 47-year-old woman complains of protracted vomiting. She has lost a large amount of gastric juice. What acid-base imbalance can be suspected in this case?

- A. Non-gaseous alkalosis
- B. Metabolic acidosis
- C. Gaseous alkalosis
- D. Gaseous acidosis
- E. Non-gaseous acidosis

50. There is a time limit for how long a person can stay at an altitude of over 800 meters above sea level without oxygen tanks. What is the limiting factor for the life under such conditions?

- A. Ultraviolet radiation level
- B. Temperature
- C. Earth's gravity
- D. Humidity level
- E. Partial pressure of oxygen in air

51. A patient has an attack of bronchospasm. What membrane cytoceptors of bronchial smooth muscles should be stimulated to improve the patient's condition?

- A. Histamine H<sub>2</sub> receptors
- B. Nicotinic acetylcholine receptors
- C.  $\alpha$ -adrenergic receptors
- D. Muscarinic acetylcholine receptors
- E.  $\beta$ -adrenergic receptors

52. During a regular examination, blood was taken from a vein of a pregnant woman for the Wasserman reaction. The reaction was positive. The patient and her husband deny extramarital sexual intercourse. What must be done to confirm or refute the diagnosis of syphilis?

- A. Perform the complement fixation test
- B. Repeat the Wasserman test
- C. Obtain a smear from the urethra
- D. Perform sedimentation tests
- E. Perform the *Treponema pallidum* immobilization test

53. The height of a 10-year-old child is 178 cm, while the child's weight is 64 kg. What endocrine gland is dysfunctional in the child, causing this condition?

- A. Pituitary gland
- B. Parathyroid gland
- C. Gonads
- D. Thyroid gland
- E. Adrenal glands

54. The biopsy material obtained from the enlarged lymph node of a patient with a subfebrile temperature contains numerous granulomas with caseous necrosis in the center. The areas of necrosis are surrounded by epithelioid cells, Langhans giant multinucleated cells, and lymphocytes. What disease can be characterized by these pathohistological

changes?

- A. Lymphogranulomatosis
- B. —
- C. Lymphosarcoma
- D. Tuberculosis
- E. Lymphocytic leukemia

55. A patient has been diagnosed with chronic gastritis. Intragastric pH-metry detects decreased acidity of the gastric juice. What cells have a reduced function in this case?

- A. Gastric chief cells
- B. Mucocytes
- C. —
- D. Gastric parietal cells
- E. Enteroendocrine cells

56. A patient presents with impaired twilight vision. What vitamin preparation should be prescribed to this patient?

- A. Ascorbic acid
- B. Pyridoxine hydrochloride
- C. Nicotinic acid
- D. Cyanocobalamin
- E. Retinol acetate

57. A man was hospitalized with provisional diagnosis of acute pancreatitis. What enzyme activity must be measured in the patient's blood and urine to confirm this diagnosis?

- A. ALT
- B.  $\alpha$ -amylase
- C. AST
- D. Cholinesterase
- E. Lactate dehydrogenase

58. Laboratory testing detects glucose in the urine of an 18-year-old patient, while glucose levels in the patient's blood plasma are normal. What is the likely cause of this disorder?

- A. Tubular reabsorption
- B. Insulin secretion
- C. Secretion of glucocorticoids
- D. Tubular secretion
- E. Glomerular filtration

59. A man was hospitalized with an injury to the psoas major muscle. He has lost the ability to extend the lower leg in the knee joint. What nerve is damaged in this case?

- A. Femoral
- B. Genitofemoral
- C. Iliinguinal
- D. Obturator
- E. Iliohypogastric



60. A patient developed hyperchromic anemia after gastric resection. What drug must be prescribed in this case?

- A. Folic acid
- B. Coamid
- C. Ferrum Lek
- D. Ferbitol
- E. Cyanocobalamin

61. A 35-year-old woman came for a follow-up visit two weeks after a case of COVID-19. ECG detects a decrease in the voltage of the waves, the P wave is unchanged and connected to the QRS complex, the duration of the PQ interval is 0.32 seconds. What type of arrhythmia did the patient develop?

- A. Second-degree atrioventricular block
- B. First-degree atrioventricular block
- C. Sinoatrial block
- D. Third-degree atrioventricular block
- E. Wolff-Parkinson-White syndrome

62. A patient was diagnosed with an injury to the middle third of the shoulder with an incomplete rupture of the median nerve. In addition to motor and sensory disorders below the injury site, the patient complains of an unbearable sharp burning pain. What is the nature of this pain?

- A. Projected pain
- B. Somatic pain
- C. Phantom pain
- D. Referred pain
- E. Causalgia

63. Residents of areas with a cold climate have increased blood levels of a certain hormone that has an adaptive thermoregulatory value. What hormone is it?

- A. Insulin
- B. Glucagon
- C. Somatotropin
- D. Cortisol
- E. Thyroxine

64. A child has 3 copies of chromosome 18, which resulted in characteristic cranial elongation from front to back, maldevelopments of the musculoskeletal system, fused fingers, and maldevelopments of skeletal muscles. What hereditary pathology is observed in this child?

- A. Patau syndrome
- B. Down syndrome
- C. Edwards syndrome
- D. Turner syndrome
- E. Klinefelter syndrome

65. When pressure in the aorta sharply increases, the force and rate of cardiac contractions decrease. What nerve contains sensitive fibers from baroreceptors of the aortic arch?

- A. Recurrent laryngeal nerve
- B. Inferior cervical cardiac nerve (Pavlov's nerve)
- C. Glossopharyngeal nerve
- D. Carotid sinus nerve (Hering's nerve)
- E. Vagus nerve

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

67. A surgeon performs an operation on the sigmoid colon, stopping the bleeding from *aa. Sigmoidae*. They are the branches of the following artery:

- A. *A. colica sinistra*
- B. *A. mesenterica inferior*
- C. *Truncus coeliacus*
- D. *A. mesenterica superior*
- E. *A. colica dextra*

68. A patient was prescribed a drug with methionine to maintain liver function. Synthesis of what substance is ensured in this case?

- A. Citrate
- B. Phosphatidylserine
- C. Pyruvate
- D. Phosphatidylcholine
- E. Lactate

69. A patient with pulmonary fibrosis presents with decreased pulmonary ventilation. What parameter of the external respiration system will change in this patient?

- A. Residual volume will increase
- B. Lung dead space will increase in volume
- C. Vital capacity of the lungs will decrease
- D. Expiratory reserve volume will increase
- E. Inspiratory reserve volume will increase

70. A patient has been diagnosed with atrophy of masticatory muscles. This group of muscles is innervated by branches of the following cranial nerve:



- A. Hypoglossal nerve
- B. Motor branches of the VII cranial nerve
- C. First branch of the trigeminal nerve
- D. Third branch of the trigeminal nerve
- E. Second branch of the trigeminal nerve

71. A child with von Gierke disease presents with slow growth and enlarged liver and kidneys. Reduced glucose levels and increased levels of fats and uric acid are detected in the child's blood. What enzyme is absent in this case, causing this type of glycogenesis?

- A. Phosphofructokinase
- B. Glucose-6-phosphatase
- C. Glycogen synthase
- D. Amylo-1,6-glucosidase
- E. Hepatic phosphorylase

72. In the human body, reserves of hydrocarbons are localized mainly in the liver and skeletal muscles. Which reserve becomes mobilized to maintain blood glucose levels during fasting?

- A. Amylopectin
- B. Hepatic glycogen
- C. Muscle glycogen
- D. Starch
- E. Cellulose

73. Despite profuse sweating, a person feels stuffy and hot in a tropical forest at a relatively low air temperature (26–27°C). Why is profuse sweating not an effective method of heat transfer in this case?

- A. Air temperature reduces sweat evaporation
- B. High air humidity reduces radiation
- C. Air temperature increases sweat evaporation
- D. High air humidity increases sweat evaporation
- E. High air humidity reduces sweat evaporation

74. In an experiment, a neuromuscular preparation of frog was treated with a curare-like substance. As a result, muscle contractions in response to electrical stimulation of the nerve disappeared. What function of the muscle cell membrane is disrupted by curare-like drugs?

- A. Reception of mediators in the neuromuscular synapse
- B. Creating a barrier between the intracellular environment and the surrounding intercellular fluid
- C. Creation of electric potentials on the both sides of the membrane
- D. Maintenance of the internal cellular structure, its cytoskeleton
- E. Maintenance of different permeability for different substances

75. Nosocomial pneumonia was diagnosed in a 38-year-old inpatient. The doctor prescribed the patient a broad-spectrum antibiotic that is resistant to  $\beta$ -lactamases, inhibits peptidoglycan synthesis in the bacterial membrane, and practically cannot be degraded by dehydropeptidase-1 in the renal tubules. What antibiotic did the patient receive?

- A. Levofloxacin
- B. Rifabutin
- C. Erythromycin
- D. Streptomycin
- E. Meropenem

76. A 26-year-old woman, who one year ago had a difficult childbirth with a hemorrhage, complains of general weakness, weight loss of 18 kg, and absence of menstruations. Objectively, she has mammary hypoplasia. She was diagnosed with Simmonds disease. What is the main mechanism of the weight loss in this woman?

- A. Decreased production of adenohypophysis hormones
- B. Hypoparathyroidism
- C. Decreased function of the gonads
- D. Hypothyroidism
- E. Decreased function of the adrenal cortex

77. A patient has a knee joint injury with a crushed patella. What muscle in the thigh is likely to have damaged tendons in case of such an injury?

- A. Quadriceps femoris muscle
- B. Adductor magnus muscle
- C. Sartorius muscle
- D. Adductor longus muscle
- E. Biceps femoris muscle

78. A person was hospitalized with morphine poisoning. In cases of acute morphine poisoning, a specific antagonist — naloxone — is used. What is the main factor in the development of antagonistic action in such cases?



- A. Direct stimulation of the respiratory center
- B. Decreased sensitivity of the body to morphine
- C. Sharp acceleration of morphine metabolism
- D. Reflex excitation of the respiratory center
- E. Competition for binding to opioid receptors

79. A patient has been diagnosed with mitral valve stenosis. What pathogenetic type of heart failure is it?

- A. Heart failure due to myocardial damage
- B. Mixed form of heart failure
- C. Pressure overload-induced heart failure
- D. Volume overload-induced heart failure
- E. Heart failure due to myocardial hypertrophy

80. Numerous glucose oxidation metabolites are dissolved in the cytoplasm of myocytes. Which one of those metabolites directly converts into lactate?

- A. Glycerophosphate
- B. Oxaloacetate
- C. Fructose-6-phosphate
- D. Glucose-6-phosphate
- E. Pyruvate

81. As a result of cerebral hemorrhage, the patient developed impaired speech perception (sensory aphasia). What brain structure is likely to be damaged in this case?

- A. Superior temporal gyrus
- B. Inferior frontal gyrus
- C. Inferior temporal gyrus
- D. Postcentral gyrus
- E. Superior frontal gyrus

82. A 43-year-old man was hospitalized with complaints of fever with chills, loss of appetite, malaise, diarrhea, and diffuse abdominal pain, observed for the last week. The fever started slowly and gradually increased to the current 39.8°C. The blood pressure is 110/70 mm Hg. Objectively, the tongue is coated, the spleen is enlarged, and there is a roseola rash on the abdomen. The Widal agglutination test to O-antigen is positive with titer of 1:200. What microorganism is the most likely cause of the patient's condition in this case?

- A. *Mycobacterium tuberculosis*
- B. *Leptospira interrogans*
- C. *Vibrio cholerae*
- D. Enterohemorrhagic *E. coli*
- E. *Salmonella typhi*

83. Autopsy of the body of a man who died of ethylene glycol poisoning revealed slightly enlarged edematous kidneys with the capsule that could be very easily removed. The cortical substance is pale gray and wide. The medullary substance is dark red. What kidney pathology developed in the patient?

- A. Acute tubulointerstitial nephritis
- B. Lipoid nephrosis
- C. Acute pyelonephritis
- D. Necrotic nephrosis
- E. Acute glomerulonephritis

84. A man was hospitalized with arrhythmia. What antiarrhythmic drug should he be prescribed?

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

85. Before a surgery, the patient was prescribed a synthetic antiprotozoal drug to prevent a wound infection. The prescribed drug is highly effective against *Helicobacter pylori*. What drug is it?

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

86. A patient presents with a sharp decrease in oncotic pressure and albumin levels in the blood plasma. What would be the result of this condition?

- A. Increased blood density
- B. Increased blood volume
- C. Reduced diuresis
- D. Edema
- E. Reduced ESR

87. What period of the malaria plasmodium life cycle coincides with the manifestation of clinical symptoms of malaria in a patient?

- A. When merozoites emerge from destroyed erythrocytes
- B. When sporozoites enter the human bloodstream
- C. During gametocyte formation
- D. When merozoites invade erythrocytes
- E. In the period of tissue schizogony

88. After an industrial accident, a man was exposed to potassium cyanide, which resulted in cytochrome oxidase blockade in this man. What pathological process can



be observed in the patient in this case?

- A. Tissue hypoxia
- B. Respiratory hypoxia
- C. Hemic hypoxia
- D. Hypoxic hypoxia
- E. Circulatory hypoxia

89. The corpus luteum forms during the luteal phase of the menstrual cycle. This temporary endocrine gland stimulates the synthesis of a certain hormone. What hormone is it?

- A. Progesterone
- B. Corticosterone
- C. Parathyroid hormone
- D. Aldosterone
- E. Testosterone

90. In a 67-year-old patient, who has been suffering from chronic bronchitis for 17 years, bronchial biopsy detects cylindrical dilation of the bronchi, cystic changes in the mucous glands, and areas, where prismatic epithelium is replaced with stratified squamous epithelium. What pathological process was detected in the bronchial mucosa?

- A. Hyperplasia
- B. Hypertrophy
- C. Metaplasia
- D. Dysplasia
- E. Heterotopia

91. In a scientific experiment, a structure in one of the cell components has been destroyed, impairing the cell's ability to divide. What structure has been destroyed?

- A. Microfibrils
- B. Glycocalyx
- C. Centrosome
- D. Ribosomes
- E. Mitochondria

92. A 27-year-old woman has undergone a sector resection of mammary gland tissue. In the excised tissue, macroscopy detects a dense white node, 4 cm in diameter, with clear boundaries. Urgent histology shows that the tumor consists of a large amount of fibrous stroma with stromal proliferation around the small canaliculi. Canalicular epithelium overlays the basement membrane and retains its polarity. What disease can be characterized by these pathological changes?

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

93. What biogenic amine normalizes circadian rhythms?

- A. Histamine
- B. Dopamine
- C. Melatonin
- D. Noradrenaline
- E. Adrenaline

94. A 35-year-old man has been hospitalized with complaints of a runny nose and headache that last for 5 days already. After examination, he was diagnosed with maxillary sinusitis (inflammation of the maxillary sinus). Through what nasal passage did the infection reach this sinus?

- A. Nasopharyngeal meatus
- B. Middle nasal meatus
- C. Superior nasal meatus
- D. Common nasal meatus
- E. Inferior nasal meatus

95. A 60-year-old woman has congestive heart failure with increased cardiac preload. What bioactive substance will be secreted by the heart in this case?

- A. Angiotensin II
- B. Vasopressin
- C. Atrial natriuretic peptide
- D. Gastric inhibitory peptide
- E. Aldosterone

96. A 38-year-old patient died with multiple thromboembolisms of various organs. In the cardiac tissue, macrophage granulomas were detected in the valvular and parietal endocardium with endocardial damage and deposition of thrombotic masses. Macrophage granulomas were detected in the myocardium, as well. These pathological changes are characteristic of the following disease:

- A. Atherosclerosis
- B. Essential hypertension
- C. Infectious myocarditis
- D. Systemic lupus erythematosus
- E. Rheumatism

97. Analysis of the patient's ECG recorded in the I, II, and III standard leads shows that the P wave is positive in each one of them. What does it indicate?

- A. Atrial depolarization rate
- B. Pumping function of the left side of the heart
- C. Mitral valve condition
- D. Ventricular depolarization rate
- E. Direction of atrial depolarization

**98.** Autopsy of the body of a patient who died with signs of cardiopulmonary failure shows deformed bronchi with sack-like protrusions of the bronchial wall and purulent inflammation. Hypertrophy of the right ventricle was detected in the heart. Amyloidosis can be observed in the kidneys. The patient's history indicates that for the last 8 years the patient complained of asphyxia and cough with purulent sputum, the patient's fingers resembled drumsticks. What disease can be characterized by these pathological changes?

- A. Abscess
- B. Acute bronchitis
- C. Bronchiectasis
- D. Chronic bronchitis
- E. Tuberculosis

**99.** An 11-year-old girl was hospitalized with complaints of weakness and facial edema, observed for 3 days. The mother claims that her daughter had always been healthy and active until these symptoms started. Physical examination reveals generalized facial edema and pitting edema on the legs (pressing the edema leaves an imprint that gradually smooths out). During the patient's history taking, the girl describes a foamy appearance of her urine but denies blood in urine, nocturia, or pain during urination. Laboratory testing detects proteinuria and microhematuria. What is the most likely cause of the changes detected in the urinalysis?

- A. Increased glomerular hydrostatic pressure
- B. —
- C. Increased plasma oncotic pressure
- D. Increased hydrostatic pressure in the Bowman's capsule
- E. Increased permeability of the glomerular capillary wall

**100.** A 47-year-old woman has interphalangeal and metacarpophalangeal joints that can be easily dislocated or subluxated and a characteristic deviation of the fingers that resembles "walrus flippers". Microscopy reveals proliferation of synovial villi, cartilage destruction, and pannus formation. What disease causes these pathological changes?

- A. Ankylosing spondylitis (Bekhterev's disease)
- B. Rheumatoid arthritis
- C. Osteoarthritis
- D. Rheumatic arthritis
- E. Systemic lupus erythematosus

**101.** A 55-year-old patient complains of pain in the joints that becomes worse before changes in the weather. Blood tests detect high levels of uric acid. What substance is breaking down, likely causing this condition in the patient?

- A. Uridine monophosphate
- B. Adenosine monophosphate
- C. —
- D. Thymidine monophosphate
- E. Cytidine monophosphate

**102.** A patient has an injury of the radiocarpal joint. What bones of the proximal row of the wrist (except the pisiform bone) form this joint?

- A. Scaphoid, trapezoid, lunate
- B. —
- C. Scaphoid, trapezoid, hamate
- D. Trapezoid, hamate, lunate
- E. Scaphoid, lunate, triquetrum

**103.** Examination detects lymphopenia in a patient, who has been taking glucocorticoids for a long time. How can the functional state of the patient's immune system be characterized in this case?

- A. Secondary immunodeficiency
- B. Tolerance to autoantigens
- C. Congenital immunodeficiency
- D. Primary immunodeficiency
- E. Anaphylaxis

**104.** There are several stages in the process of translation. At one of these stages, a complex forms that consists of a ribosome, mRNA, and aminoacyl-tRNA-methionine. What is the name of this stage?

- A. Elongation
- B. Repair
- C. Initiation
- D. Transcription
- E. Termination

**105.** A 19-year-old patient complains of diarrhea. As a part of complex therapy, the doctor prescribed the patient an antidiarrheal drug that stimulates opioid receptors in the intestine. What drug was prescribed for this patient?



- A. Furazolidone
- B. Loperamide
- C. Rehydron
- D. Omnopon (Papaveretum)
- E. Linex

106. Increased levels of ammonium salts in the patient's urine can be associated with the development of a pathological condition. What pathological condition is likely in such cases?

- A. Hypercholesterolemia
- B. Retention azotemia
- C. Steatosis
- D. Hyperuricemia
- E. Metabolic acidosis

107. Human brain produces endogenous peptides that are similar to morphine and can reduce pain perception. Select such peptides from the list below.

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

108. A 9-year-old child developed a severe case of purulent destructive pneumonia, for which the child was receiving a massive antibacterial therapy. The disease was rapidly progressing. Against the background of marked intoxication, a sharp drop in blood pressure was registered, the child went into a state of shock that resulted in the child's death. What etiopathogenetic type of shock developed in the child?

- A. Hypovolemic shock
- B. Toxic shock syndrome
- C. Anaphylactic shock
- D. Hemolytic shock
- E. Cardiogenic shock

109. Increased levels of direct bilirubin and bile acids were detected in the blood of a patient with jaundice. There is no stercobilinogen in the patient's urine. In what type of jaundice can these signs be observed?

- A. Suprahepatic
- B. Hemolytic
- C. Hepatic
- D. Mechanical
- E. Parenchymatous

110. A patient diagnosed with essential hypertension was undergoing hypothiazide (hydrochlorothiazide) treatment. He complains of general weakness, loss of appetite, and palpitations. Examination

reveals muscle hypotonia, flaccid paralyses, and decreased intestinal peristalsis. What is the likely cause of the patient's condition?

- A. Hypercalcemia
- B. Hyponatremia
- C. Hyperkalemia
- D. Hypokalemia
- E. Hyperuricemia

111. A patient complains of frequent bleeding from the gums. Blood test detects deficiency of blood coagulation factor II (prothrombin). What phase of blood coagulation is primarily disturbed in this patient?

- A. Fibrinolysis
- B. Fibrin formation
- C. Prothrombinase formation
- D. Thrombin formation
- E. Clot retraction

112. Laboratory findings of a patient diagnosed with jaundice are as follows: HBsAg-, HBeAg-, anti-HBsAg+, anti-HBsM-, HCAg+. What disease can be characterized by such laboratory findings?

- A. Hepatitis B reinfection
- B. Chronic hepatitis B with low replicative activity
- C. —
- D. Hepatitis B relapse
- E. Hepatitis C with history of hepatitis B

113. A certain infectious agent can damage mucosa, cause inflammation of internal organs, sepsis, provoke formation of blue-green pus, and is quite resistant to most antibiotics. What pathogen is it?

- A. *Proteus vulgaris*
- B. *Pseudomonas aeruginosa*
- C. *Staphylococcus aureus*
- D. *Escherichia coli*
- E. *Streptococcus mutants*

114. A 44-year-old woman has arterial hypertension caused by a pheochromocytoma — a tumor of the adrenal medulla. What group of antihypertensive drugs should be prescribed for this patient?

- A.  $\beta$ -blockers
- B. Calcium antagonists
- C. Sympatholytics
- D. Ganglionic blockers
- E.  $\alpha$ -blockers

115. In an experiment, certain nuclei of the hypothalamus were destroyed in homeothermic animals, which resulted in them being unable to maintain their body

temperature. What nuclei were destroyed?

- A. Supraoptic nuclei
- B. Medial hypothalamic nuclei
- C. Lateral hypothalamic nuclei
- D. Ventral hypothalamic nuclei
- E. Posterior hypothalamic nuclei

116. A patient was hospitalized with the provisional diagnosis of typhoid fever. The disease onset was three days ago. The temperature is 39°C. What method of laboratory diagnostics must be used to confirm this diagnosis?

- A. Obtaining a biliculture
- B. Obtaining a coproculture
- C. Obtaining a urinoculture
- D. Serology
- E. Obtaining a blood culture

117. A child with hemorrhagic syndrome was diagnosed with hemophilia B. What coagulation factor is deficient in this case, causing this type of hemophilia in the patient?

- A. VIII (antihemophilic globulin)
- B. II (prothrombin)
- C. IX (Christmas factor)
- D. XI (prothromboplastin)
- E. XII (Hageman factor)

118. Medical examination detected angina pectoris in a patient. The doctor prescribed the patient metoprolol that reduces the strength and frequency of cardiac contractions and, as a result, reduces the myocardial oxygen demand. What is the mechanism of the therapeutic action of this drug?

- A. Blockade of muscarinic acetylcholine receptors
- B. Blockade of  $\beta_2$ -adrenergic receptors
- C. Stimulation of  $\beta_1$ -adrenergic receptors
- D. Blockade of  $\beta_1$ -adrenergic receptors
- E. Blockade of nicotinic acetylcholine receptors

119. Chemically, thyroid hormones (thyroxine and triiodothyronine) are amino acid derivatives. Name this amino acid.

- A. Tyrosine
- B. Methionine
- C. Proline
- D. Threonine
- E. Tryptophan

120. A patient was hospitalized with the provisional diagnosis of diphyllbothriasis. What food products could have caused this

disease?

- A. Milk and eggs
- B. Vegetables and fruits
- C. Fish
- D. Beef
- E. Pork

121. Examination of a 32-year-old patient detects a disproportional structure of the skeleton and enlarged brow ridges, nose, lips, tongue, jawbones, and feet. What is the likely cause of the development of these disorders?

- A. Increased thyroxine levels
- B. Decreased insulin levels
- C. Increase catecholamine levels
- D. Increase glucagon levels
- E. Increased levels of somatotrophic hormone

122. Problems with the processes of lipid breakdown in small intestine are caused by disturbed lipase activity. What factor activates lipase?

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

123. After eating canned mushrooms, a person developed signs of bulbar paralysis: ptosis, diplopia, aphonia, difficulty swallowing. Provisionally, this person was diagnosed with botulism. What reaction can be used in this case to determine the type of toxin?

- A. Immunofluorescence
- B. Precipitation
- C. Neutralization
- D. Complement fixation
- E. Agglutination

124. A certain vitamin, as a coenzyme, is a component of glutamic acid decarboxylase, it takes part in GABA formation and its deficiency can cause convulsions. Name this vitamin.

- A. Folic acid
- B. Tocopherol
- C. Ascorbic acid
- D. Cobalamin
- E. Pyridoxine

125. Family of a 52-year-old man brought him to a doctor with complaints that he does not understand spoken words, despite being able to speak himself. He cannot read written text, as well. Where is the brain damage localized in this case?



- A. In the cortex of the posterior part of the inferior frontal gyrus
- B. —
- C. In the cortex of the posterior part of the superior temporal gyrus
- D. In the hippocampus
- E. In the cortex of the anterior part of the superior temporal gyrus

126. Examination detected the following changes in the patient's peripheral blood: erythrocytes —  $3.0 \cdot 10^{12}/L$ , Hb — 80 g/L, leukocytes —  $21 \cdot 10^9/L$ . The following is observed in the leukogram: basophils — 0%, eosinophils — 0%, myeloblasts — 54%, promyelocytes — 1%, myelocytes — 0%, metamyelocytes — 0%, band neutrophils — 1%, segmented neutrophils — 28%, lymphocytes — 13%, monocytes — 3%. What pathology corresponds with these findings?

- A. Acute myeloblastic leukemia
- B. Undifferentiated leukemia
- C. Erythromyelosis
- D. Leukemoid reaction
- E. Chronic myeloid leukemia

127. Blood test revealed the total leukocyte count of  $11 \cdot 10^9/L$  in the patient's blood, with neutrophils making up 80% of all leukocytes. Among them, banded neutrophils make up 9%. What is the nature of the changes in the cellular composition of WBC in this patient?

- A. Lymphocytosis
- B. Neutrophilic right shift
- C. Neutrophilic left shift
- D. Leukopenia
- E. Neutropenia

128. A 56-year-old patient complains of an acute pain attack in the area of the right ankle joint. Objectively, the joint is hyperemic, edematous, and hot to the touch. The levels of uric acid in the blood are elevated. For the treatment of this pathology, the doctor prescribed a drug that inhibits xanthine oxidase. What drug is it?

- A. Prednisolone
- B. Urolesan
- C. Diacarb (Acetazolamide)
- D. Theophylline
- E. Allopurinol

129. A 14-year-old patient has a positive nitrogen balance. What is the likely cause of this condition?

- A. Significant physical exertion
- B. Body growth
- C. Starvation
- D. Low-protein diet
- E. Emotional stress

130. A woman was diagnosed with Chlamydia-induced pneumonia. The doctor prescribed her antibiotic doxycycline. What type of pharmacotherapy is it?

- A. Replacement
- B. Etiotropic
- C. Symptomatic
- D. Pathogenetic
- E. Preventive

131. X-ray detects a shadow in the area of the patient's dural sinus that runs from the crista galli of the ethmoid bone of the skull to the internal occipital protuberance. In this case, pathological changes can be detected in the area of the following sinus:

- A. *Sinus sagittalis superior*
- B. *Sinus rectus*
- C. *Sinus sigmoideus*
- D. *Sinus sagittalis inferior*
- E. *Sinus transversus*

132. Alveoli of the lungs have special cells, through which gas exchange occurs. These cells are a part of the blood-air barrier. Name these cells.

- A. Microvillous epithelial cells
- B. Clara cells
- C. Alveolar type I cells
- D. Alveolar macrophages
- E. Alveolar type II cells

133. A patient died of secondary bacterial pneumonia. Autopsy revealed pale yellow muscles with numerous foci of calcinosis. In the muscles, microscopy shows dystrophic changes, absence of striations, and reduced glycogen levels. Edema and inflammation were detected in the stroma. The cellular infiltrate is represented by lymphocytes, macrophages, and plasma cells. Sclerotic changes were detected in the heart, lungs, and liver. These pathological changes are characteristic of the following disease:

- A. Zenker's degeneration of muscles in typhoid fever
- B. Myopathy
- C. Myositis
- D. Systemic scleroderma
- E. Dermatomyositis (Wagner-Unverricht-Hepp disease)

134. Postmortem examination of the fetus from the second pregnancy of an Rh-

negative mother is being performed. The fetus died in utero at 7 months of pregnancy. Autopsy detects diffuse edema of the subcutaneous tissue and brain, ascites, enlarged liver and spleen, thymic atrophy, and myocardial hypertrophy. Microscopy reveals centers of extramedullary hematopoiesis, as well as dystrophic and necrobiotic changes in internal organs. What form of hemolytic disease corresponds with these pathological changes?

- A. Edematous form
- B. Anemic form
- C. —
- D. Congenital icteric form
- E. Postpartum icteric form

135. Against the background of ionizing radiation exposure, a decrease in the granulocyte count was detected in the patient's blood. What causes agranulocytosis in this case?

- A. Autoimmune process development
- B. Disturbed release of mature leukocytes from the bone marrow
- C. Increased migration of granulocytes into tissues
- D. Leukopoiesis inhibition
- E. Increased leukocyte destruction

136. How can vitamin D deficiency manifest in an adult?

- A. Anemia
- B. Osteoporosis
- C. Neurological disorders
- D. Problems with twilight vision
- E. Rickets

137. The patient's body fluids, especially urine, have a specific sweet smell, caused by disturbed metabolism of certain amino acids, such as leucine, isoleucine, and valine. What disease can be characterized by these pathological changes?

- A. Fructosuria
- B. Alkaptonuria
- C. Galactosemia
- D. Maple syrup urine disease
- E. Phenylketonuria

138. A 32-year-old woman was diagnosed with myocarditis. ECG detects a disturbance of the cardiac rhythm (a non-sinus rhythm). What cardiomyocytes are dysfunctional in this case?

- A. Transitional conducting cardiomyocytes
- B. Conducting cardiomyocytes of the bundle of His
- C. Pacemaker cells
- D. Conducting cardiomyocytes of the His bundle branches
- E. Contractile cardiomyocytes

139. During a surgery for a splenic injury, the surgeon must ligate the artery that supplies the spleen with blood. This artery is a branch of:

- A. *A. gastroduodenalis*
- B. *A. hepatica propria*
- C. *A. gastrica sinistra*
- D. *A. hepatica communis*
- E. *Truncus coeliacus*

140. A patient presents with impaired water reabsorption in the kidneys, which is directly related to disturbed secretion of a certain hormone. Name this hormone.

- A. Parathyroid hormone
- B. Thyrocalcitonin
- C. Natriuretic hormone
- D. Aldosterone
- E. Vasopressin

141. A 55-year-old patient is being monitored by an endocrinologist for disturbed endocrine function of the pancreas, which manifests as a decrease in glucagon levels in the blood. What pancreatic cells are dysfunctional in this case?

- A. PP cells of the islets of Langerhans
- B. Alpha cells of the islets of Langerhans
- C. Delta-1 cells of the islets of Langerhans
- D. Delta cells of the islets of Langerhans
- E. Beta cells of the islets of Langerhans

142. Examination of a patient shows the following: blood pressure — 180/110 mm Hg, heart rate — 95/min. X-ray detects narrowing of one of the renal arteries. What system was activated, causing the hypertensive state in this patient?

- A. Immune system
- B. Sympathoadrenal system
- C. Kinin system
- D. Renin-angiotensin system
- E. Hemostatic system

143. Vitamin A deficiency causes impaired twilight vision. What cells have this receptor function?



- A. Bipolar neurons
- B. Neurosensory cone cells
- C. Retinal horizontal cells
- D. Neurosensory rod cells
- E. Ganglionic neurons

144. A patient has been diagnosed with psychosis. After two weeks of receiving pharmacotherapy, the patient's condition improved. However, the patient soon developed rigidity, tremors, and hypokinesia. What drug causes these complications?

- A. Imizin (Imipramine)
- B. Diphenin (Phenytoin)
- C. Chlordiazepoxide
- D. Sydnocarb (Mesocarb)
- E. Aminazine (Chlorpromazine)

145. As proposed by the World Health Organization, diabetes mellitus is divided into type 1 and type 2. What is the etiological factor of type 1 diabetes mellitus?

- A. Damage to the pituitary gland
- B. Absence of insulin receptors
- C. Damage to  $\beta$ -cells
- D. High insulinase activity
- E. Strong bond between insulin and protein

146. A 36-year-old patient developed angina pectoris attacks immediately after the recovery from a case of staphylococcal sepsis. Coronary angiography revealed mural thrombosis in the left coronary artery without signs of atherosclerosis. What substance was released during the endothelial damage, causing the thrombus formation in this case?

- A. Platelet-activating factor
- B. Phospholipase A<sub>2</sub>
- C. Adenosine triphosphate
- D. Serotonin
- E. Adenosine diphosphate

147. Some parasites in their life cycle may have a host that can accumulate the parasite at its invasive stage and facilitate its transmission to the final host. What type of host is it?

- A. Additional host
- B. Optional host
- C. Obligate host
- D. Reservoir host
- E. Definitive host

148. The mother complains that her 7-month-old child has recurrent bacterial infections, such as conjunctivitis, otitis, sinopulmonary infections, diarrhea, and skin infections. Examination detects reduced size of the child's tonsils and lymph nodes. In the blood, examination of serum immunoglobulins shows noticeably reduced levels of IgM, IgA, and IgE. IgG is less than 100 mg/dL. What disease can be characterized by these pathological changes?

- A. Wiskott-Aldrich syndrome
- B. DiGeorge syndrome
- C. Hereditary adenosine deaminase defect in T lymphocytes
- D. X-linked agammaglobulinemia (Bruton disease)
- E. Hypogammaglobulinemia

149. Pepsin is the enzyme of gastric juice that is secreted in its inactive form of pepsinogen. What is the mechanism of its activation?

- A. Dephosphorylation
- B. Phosphorylation
- C. Limited proteolysis
- D. Methylation
- E. Acetylation

150. A 59-year-old man was hospitalized in a severe condition with the diagnosis of initial pulmonary edema and acute myocardial infarction in the area of the posterior wall of the left ventricle and the septum. What mechanism is primary in the development of pulmonary edema in this patient?

- A. Reduction of alveolar-capillary diffusion of oxygen
- B. Pulmonary venous hypertension
- C. Hypoxemia
- D. Pulmonary arterial hypertension
- E. Left ventricular failure