1. In the process of glucose transformation in the pentose cycle, phosphates of various monosaccharides are formed. Which one of them can be used in the synthesis of nucleic acids?

A. Ribose-5-phosphate
B. Ribulose-5-phosphate
C. Erythrose-4-phosphate
D. Sedoheptulose-7-phosphate
E. Pentose-5-phosphate

2. Because of a case of diphtheria, a group of students needs preventive vaccination. What must be used to create the artificial active immunity in this case?

A. Diphtheria anatoxin
B. Antidiphtheria serum
C. Specific immunoglobulin
D. DPT vaccine
E. Inactivated bacterial vaccine

3. A person has an incised stab wound in the lower part of the posterior wall of the axillary fossa. What muscle is damaged in this case?

A. Latissimus dorsi muscle
B. Triceps brachii
C. Pectoralis major
D. Deltoid muscle
E. Infraspinatus muscle

4. In an experiment, the threshold stimulation force for the cells of various tissues was studied. Where was it the smallest?

A. Motor neurons of the spinal cord
B. Glandular cells
C. Skeletal muscle cells
D. Smooth muscle cells
E. Cardiomyocytes

5. On the second day after the development of a transmural myocardial infarction, the patient developed a sharp drop in systolic blood pressure to 60 mm Hg, tachycardia of 140/min., dyspnea, and loss of consciousness. What mechanism is the leading one in the pathogenesis of the developed shock?

A. Decreased stroke volume of the heart
B. Intoxication with necrotic decay products
C. Decreased volume of the circulating blood
D. Paroxysmal tachycardia
E. Anaphylactic reaction to myocardial proteins

6. A 50-year-old patient complaining of weight loss and weakness presents with hypoglycemia and hyperinsulinemia in the blood. An additional examination detected a tumor of the islets of Langerhans. What cell atypism causes increased insulin synthesis in this case?

A. Functional
B. Morphological
C. Biochemical
D. Physical and chemical
E. Immunological

7. 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. Neutralization
B. Agglutination
C. Precipitation
D. Complement fixation
E. Immunofluorescence

8. In the nucleus of a cell, a molecule of mature mRNA was formed from an immature mRNA molecule. The mature mRNA molecule is smaller in size than the immature mRNA molecule. What is the collective name of all the stages of this transformation?

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

9. A patient with an open spinal injury presents with a rupture of the right half of the spinal cord. What type of sensitivity can be expected to disappear only on the side, where the rupture has occurred?

A. Proprioceptive sensitivity
B. Thermal sensitivity
C. Pain sensitivity
D. Tactile sensitivity
E. —

10. A 6-year-old child developed hyperergic inflammation of the upper respiratory tracts. The risk of developing a severe respiratory disorder arose, necessitating the use of anti-inflammatory hormones. What hormone has an anti-inflammatory effect?

A. Cortisol
B. Adrenaline
C. Somatotropin
D. Testosterone
E. Insulin

11. Autopsy of the body of a person, who died after an abdominal surgery, revealed numerous thrombi in the veins of the lesser pelvis. Clinical diagnosis of thromboembolic syndrome was made. Where in the body can the thromboembolas be found in this case?

A. Pulmonary arteries
B. Portal vein
C. Left ventricle of the heart
D. Brain
E. Leg veins

12. The ECG of a 30-year-old man shows a decrease in the amplitude of the R wave. What does this wave mean on the ECG?

A. Ventricular depolarization
B. Excitation spreading from the atria to the ventricles
C. Electrical diastole of the heart
D. Ventricular repolarization
E. Atrial depolarization

13. 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. Chronic myeloid leukemia
C. Erythromyelosis
D. Leukemoid reaction
E. Undifferentiated leukemia

14. A patient has been diagnosed with peptic ulcer disease of the stomach and hyperacidity. Endoscopical and bacteriological studies allowed isolating *Helicobacter* bacteria. What characteristic of these microorganisms allows them to survive in the acidic environment of the stomach?

A. Urease activity
B. Catalase activity
C. Oxidase activity
D. Resistance to vancomycin
E. Capsule formation

15. A 27-year-old man presents with pathological changes in his liver and brain. His blood plasma exhibits an acute decrease in copper levels, while urine copper levels are elevated. The patient has been diagnosed with Wilson disease. To confirm this diagnosis, it is necessary to measure the activity of a certain enzyme in the patient's blood serum. What enzyme is it?

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

16. A patient needs emergency botulism prophylaxis. What should be used for this purpose?

A. Polyvalent antitoxic serum
B. Interferon
C. Monovalent antitoxic serum
D. Anatoxin
E. Placental γ globulin

17. A 30-year-old woman was hospitalized with the diagnosis of primary syphilis. What drug should be prescribed for this patient?

A. Benzylpenicillin
B. Phenoxymethylpenicillin
C. Tetracycline
D. Chloramphenicol
E. Cefazolin

18. A 26-year-old woman had a difficult childbirth with hemorrhage one year ago. Now she complains of general weakness, weight loss of 18 kg, and no menstruations. Objectively, she has hypoplasia of the mammary glands. The woman was diagnosed with Simmonds' disease. What is the main mechanism of weight loss in this woman?

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

19. Autopsy of the body of a 63-year-old man, who died of lung cancer, detected multiple metastases. What metastases can

be classified as implantation (contact) metastases, based on their mechanism of development?

A. Small multiple tumor nodules on the pleura
B. Metastases into the peribronchial, bifurcation, and paratracheal lymph nodes
C. Metastases into the brain
D. Metastases into the adrenal glands
E. Invasion of the tumor from the bronchus into the esophagus

20. A young person developed a painless neoplasm without clear boundaries in the soft tissues of the left thigh. A biopsy material of the tissues shows that the neoplasm consists of immature fibroblasts. Make the diagnosis.

A. Fibrosarcoma
B. Myosarcoma
C. Fibroma
D. Cancer
E. Myoma

21. Autopsy of the body a 40-year-old man detected a dense subpleural area 1.5 cm in diameter with clear borders in the third segment of the right lung. The affected area is surrounded with whitish fibrous tissue and has crumbling white-yellow areas on section. What can be characterized by the presence of such a lesion focus?

A. Encapsulated primary affect
B. Peripheral cancer
C. Chondroma
D. Fibroma
E. Organizing pulmonary infarction

22. Familial hypercholesterolemia was detected during the examination of a teenager with xanthomatosis. In this pathology, a significantly increased concentration of certain lipoproteins can be observed in the blood. Name these lipoproteins?

A. Low-density lipoproteins
B. Chylomicrons
C. Very-low-density lipoproteins
D. High-density lipoproteins
E. Non-esterified fatty acids (NEFA)

23. A 55-year-old man underwent a surgery for acute appendicitis. The next day, after he got out of the bed, he felt a lack of air, developed marked cyanosis of the face, and fell unconscious. The state of clinical death was diagnosed, immediately after which resuscitation measures were started. After unsuccessfull resuscitation attempts, the patient was declared dead. Autopsy of the body revealed embolism of the pulmonary trunk. What is the most likely source of thromboembolism in this case?

A. Thrombosis of the leg veins
B. Thrombosis of the portal vein
C. Thrombosis of the mesenteric arteries
D. Thrombosis in the left ventricle of the heart
E. Spherical atrial thrombus (spinning ball)

24. A woman underwent a surgery for a uterine tumor. A macropreparation shows a spongy variegated node that was located in the myometrium. Histology reveals large light-colored epithelial cells, among which there are many dark-colored polymorphic cells. There is no stroma. The vessels look like cavities lined with tumor cells. There are multiple hemorrhages. What tumor was detected in this case?

A. Chorioepithelioma
B. Destructive (malignant) hydatidiform mole
C. Adenocarcinoma
D. Cavernous hemangioma
E. Medullary cancer

25. Among the drugs that are a part of complex therapy, a man with essential hypertension (blood pressure — 200/110 mm Hg) was prescribed propranolol. After 2 weeks of taking this drug, the patient developed complaints of dyspnea and difficulty breathing. What is the most likely cause of these complications and what further tactics should be chosen in this case?

A. Blockade of β_2-adrenoceptors. Prescribe a selective β_1-adrenoblocker
B. Blockade of β_1-adrenoceptors. Prescribe a selective β_2-adrenoblocker
C. Myotropic bronchospastic effect. Prescribe Euphylline (Theophylline)
D. Excitation of muscarinic acetylcholine receptors. Prescribe atropine
E. Allergic reaction. Discontinue the drug, prescribe antihistamines

26. A person has sensory aphasia and does not understand speech when spoken to. Where in the nervous system is the damage localized in this case?

A. Superior temporal gyrus
B. Middle temporal gyrus
C. Inferior frontal gyrus
D. Superior frontal gyrus
E. Middle frontal gyrus

27. Histology of a skin tumor detects adipose tissue particles of varying size,

separated by irregular layers of connective tissue. What disease can be characterized by such pathological changes?

A. Lipoma
B. Fibroma
C. Hygroma
D. Papilloma
E. Hemangioma

28. A 38-year-old man died while tryi-ng to lift a weight. Autopsy of the body shows a rupture of an extensive aneurysm of the thoracic aorta. The man had a history of visceral syphilis. What pathological process in this case resulted in the decreased strength of the aortic wall, its distension and rupture?

A. Damage to elastic fibers
B. Endovasculitis
C. Atrophy of the muscular layer
D. Vascular neoplasms
E. –

29. An infectionist has detected an acute enterocolitis syndrome with impaired processes of digestion and absorption of breakdown products in the patient. What cells of the intestinal epithelium are damaged, resulting in such disorders?

A. Columnar cells with a border
B. Columnar cells without a border
C. Goblet cells
D. Apically granular cells
E. Endocrine cells

30. A person's diet contains a large amount of carbohydrates. What structures can be detected in the cytoplasm of hepatocytes in this case?

A. Glycogen granules
B. Drops of fat
C. One big drop of fat
D. Increased number of free ribosomes
E. Lipofuscin inclusions

31. A patient presents with tachycardia, increased basal metabolic rate and body temperature, weight loss, and increased exitability. These disorders are caused by the increased secretion of hormones in the:

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

32. Bone demineralization is often observed in the elderly people. This condition can be caused by decreased secretion of a certain hormone. Name this hormone.

A. Thyrocalcitonin
B. Thyroxine
C. Insulin
D. Aldosterone
E. Parathyroid hormone

33. A 66-year-old man has been diagnosed with a malignant epithelial tumor originating from a medium-sized bronchus. What epithelium is the source of the tumor development?

A. Pseudostratified ciliated epithelium
B. Stratified non-keratinized epithelium
C. Stratified keratinized epithelium
D. Pseudostratified transitional epithelium
E. Unstratified prismatic epithelium

34. A culture of tumor cells was treated with colchicine that blocks the formation of tubulin proteins that form the division spindle. What stages of the cell cycle will become disturbed as a result?

A. Mitosis
B. Presynthetic phase
C. Synthetic phase
D. Postsynthetic phase
E. G0 phase

35. Autopsy of the body of a deceased person detected systemic enlargement of the lymph nodes with formation of tumor conglomerates. The spleen is enlarged and variegated on section: against the red background of the pulp, there are multiple small yellowish-white and grayish foci. What disease most likely corresponds with these changes?

A. Lymphogranulomatosis
B. Sarcoidosis
C. Lymphosarcoma
D. Lung cancer
E. Lymphocytic leukemia

36. When Na^+ concentration in blood plasma decreases, its reabsorption increases in the kidneys. What is the main regulatory mechanism that stimulates this process?

A. Aldosterone
B. Sympathetic reflexes
C. Parasympathetic reflexes
D. Natriuretic hormone
E. Renin

37. In an 8-year-old child with purulent otitis media, the infection has spread from the tympanic cavity to the jugular bulb. This complication develops if one of the walls

of the tympanic cavity has thinned. What wall is most likely to have an anomaly in this child?

A. Inferior wall
B. Superior wall
C. Medial wall
D. Lateral wall
E. Anterior wall

38. A biopsy material obtained from the bronchial mucosa of a 50-year-old patient with a 20-year-long history of chronic bronchitis revealed thinning of the mucosa, cyst-like transformation of the mucous glands, and foci, where prismatic epithelium was replaced with stratified squamous epithelium. What pathological process is most likely in this case?

A. Metaplasia
B. Hyperplasia
C. Heterotopia
D. Heteroplasia
E. Dysplasia

39. During the medical examination of students, they underwent a Mantoux test. What specific factors cause a positive reaction, if they are present?

A. T-lymphocytes
B. B-lymphocytes
C. Antibodies
D. Erythrocytes
E. Leukocytes

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

41. *S. aureus* cultures were isolated during bacteriology of sour cream samples. What should be done to prove the etiological role of an isolated *S. aureus* culture as the causative agent of food poisoning that occurred in a group of consumers that were eating this sour cream?

A. Detection of the enterotoxin
B. Measuring the plasma coagulase activity
C. Determining the hemotoxins
D. Determining the sucrolytic properties
E. Measuring the lecithinase activity

42. A patient has an asymmetrically distorted face and a dry eye. What nerve is likely to be damaged in this case?

A. Facial nerve
B. Maxillary nerve
C. Mandibular nerve
D. Accessory nerve
E. Hypoglossal nerve

43. A 21-year-old patient underwent removal of a tumor in the right frontal lobe of the brain. The tumor was 5 cm in diameter, with a blurry margin between it and the surrounding tissues. It looks uniform on section. Histologically, it consists of stellate cells, the numerous processes of which form dense plexuses. What tumor is it?

A. Astrocytoma
B. Oligodendroglioma
C. Ganglioneuroma
D. Ependymoma
E. Choroid papilloma

44. In the admission room of a hospital, material samples are being taken for bacteriological testing. What is the purpose of taking a material sample from a patient with a purulent lesion of the deep tissues of the leg?

A. Establishing the etiology of the purulent process and determining the sensitivity to antibiotics
B. Identification of the pathogenic staphylococcus and determining the antibiotic resistance profile
C. Identification of the pathogen to prevent a nosocomial infection
D. Confirmation of the diagnosis of anaerobic infection
E. Determining the pathogen's toxicity

45. During fibrogastroduodenoscopy, the doctor must examine the major duodenal papilla. What anatomical structure can be used as a landmark to find the major duodenal papilla?

A. Longitudinal fold of the duodenum
B. Circular folds of the duodenum
C. Duodenal bulb
D. Duodenal glands
E. Hepatoduodenal ligament

46. A patient has an injury of soft tissues

and parietal bones in the area of their junction. The injury is accompanied by heavy bleeding. What vascular formation is damaged in this case?

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

47. The upper limbs of a person standing upright at rest are slightly flexed. What causes such position of the limbs?

A. Reflex from muscle spindles when stretching the biceps muscle
B. Innate readiness to act
C. Antagonistic reflex on the part of extended lower limbs
D. Reflex from vestibular receptors of the vestibular system
E. Tonic influence of the limbic structures and neocortex

48. A patient was diagnosed with an esophageal foreign body, located at the level of the fourth thoracic vertebra. In which anatomic constriction of the esophagus did the foreign body stop?

A. Aortic constriction
B. Pharyngeal constriction
C. Bifurcation constriction
D. Diaphragmatic constriction
E. Abdominal constriction

49. In an experiment on a spinal frog, after increasing the skin area treated with an acid solution, the time of the protective flexion reflex decreased from 10 to 6 seconds. What mechanism underlies the reduction of the reflex time?

A. Spatial summation of excitation
B. Excitation radiation by divergent nerve circuits
C. Temporal summation of excitation
D. Principle of dominance
E. Recirculation of excitation

50. In the practice of emergency therapy and resuscitation, medical conditions accompanied by edema of brain cells are often encountered. To combat this condition, patients need to be administered substances with a certain effect. What effect do these substances have?

A. They increase the colloid osmotic blood pressure
B. They change the acid-alkaline balance of the blood
C. They lower the systemic arterial pressure
D. They lower the central venous pressure
E. They reduce the volume of the circulating blood

51. During the viroscopy of the cell monolayer infected with an infectious material, a medical laboratory scientist made the diagnosis of respiratory syncytial virus infection. What changes does this virus cause in the cell culture?

A. Formation of multinucleated cells
B. Rounded cell degeneration
C. Total destruction of the cell monolayer
D. The presence of Babes-Negri bodies
E. Exfoliation of the monolayer

52. When studying an isolated excitatory cell, it was determined that the cell's threshold stimulation force had significantly decreased. What could have caused it?

A. Activation of membrane sodium channels
B. Inactivation of membrane sodium channels
C. Inactivation of membrane calcium channels
D. Activation of membrane potassium channels
E. Blockade of energy production in the cell

53. A 50-year-old patient was prescribed ceftriaxone for the treatment of typhoid fever. However, the next day the patient's condition deteriorated, the temperature increased to 39.6^0C. What has likely caused the deterioration of the patient's condition?

A. Effect of the pathogen's endotoxins
B. Allergic reaction
C. Pathogen's resistance to ceftriaxone
D. Addition of a secondary infection
E. Reinfection

54. A 57-year-old man was diagnosed with B_{12}-deficiency anemia and prescribed treatment. Three days later, he underwent a control blood test. What finding will be the most reliable sign of an increase in erythropoiesis?

A. Increased reticulocyte count
B. Increased hemoglobin levels
C. Decreased color index
D. Increased platelet count
E. Increased leukocyte count

55. What will be caused by stimulation of the carotid sinus baroreceptors in an experiment on a dog?

A. Increased parasympathetic tone
B. Increased sympathetic tone
C. Increased heart rate
D. Decreased cardiac output
E. Increased cardiac output

56. Various substances can be used as anticoagulants, including natural polysaccharides. Select a natural polysaccharide among the substances listed below.

A. Heparin
B. Hyaluronic acid
C. Enoxaparin
D. Vitamin K
E. Dextran

57. 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 the formation of new genes that ensure the synthesis of such a large number of antibodies?

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

58. During a regular check-up of a pregnant woman, Wassermann test was positive. The pregnant woman and her husband deny extramarital sex. What should be performed in this case to confirm or refute the diagnosis of syphilis?

A. *Treponema pallidum* immobilization test
B. Urethral smear test
C. Repeated Wassermann test
D. Sedimentation tests
E. Complement fixation test

59. Analysis of the primary structure of a globin molecule revealed that glutamic acid had been replaced with valine. What hereditary pathology is it characteristic of?

A. Sickle cell anemia
B. Thalassemia
C. Minkowski-Chauffard disease
D. Favism
E. Hemoglobinosis

60. Histology of a lymph node revealed numerous enlarged lymphoid follicles with croupous proliferation centers that have a large number of mitotic figures. What is indicated by these changes?

A. Antigen stimulation with follicular hyperplasia
B. Atrophy of lymphoid tissue
C. Lymphosarcoma
D. Lymphogranulomatosis
E. Lymphocytic leukemia

61. In a vertical position, the patient loses his balance and almost falls down, when his eyes are closed. What part of his brain is likely to be damaged?

A. Cerebellum
B. Basal ganglia
C. Limbic system
D. Thalamus
E. Precentral gyrus of the cerebral cortex

62. After ligation of one of the branches of the coronary arteries in a dog, the dog developed a myocardial infarction, accompanied by the phenomena of resorption-necrotic syndrome. What is the most characteristic sign of the development of this syndrome?

A. Increased blood levels of creatine kinase
B. Increased blood levels of catecholamines
C. Retrosternal pain
D. Ventricular fibrillation
E. Decreased minute blood volume

63. After administration of a local anesthetic, the patient developed anaphylactic shock. What mechanism of blood circulation disturbance is the leading one in this case?

A. Decreased vascular tone
B. Hypervolemia
C. Increased vascular tone
D. Activation of the sympathoadrenal system
E. Reduced contractile function of the heart

64. A few hours after receiving a burn, a focus of necrosis appeared on the skin with hyperemia and edema. What is the main mechanism of intensification of destructive phenomena in the inflammation focus?

A. Secondary alteration
B. Primary alteration
C. Lymphocyte emigration
D. Erythrocyte diapedesis
E. Fibroblast proliferation

65. A patient, who underwent a long-tem

glucocorticoid treatment, presents with gastric ulcers. What mechanism is the main one in their development?

A. Increased secretion and acidity of gastric juice
B. Decreased levels of histamine in the gastric mucosa
C. Increased tone of the sympathetic nervous system
D. Increased production of prostaglandins E1 and E2
E. Decreased tone of the parasympathetic nervous system

66. As a result of physical exertion, the person's blood clotting rate became faster, because the levels of a certain hormone increased in the blood. Name this hormone.

A. Adrenaline
B. Thyroxine
C. Somatotropin
D. Cortisol
E. Plasmins

67. A player injured his knee joint during a football match. X-ray clearly shows a fracture of the bone that is located within the thick of the quadriceps tendon of the thigh. What type of bone is it?

A. Sesamoid
B. Flat
C. Tubular
D. Pneumatic
E. Mixed

68. A 7-year-old girl has been hospitalized with a high temperature and complaints of a sore throat and general weakness. The doctor suspected diphtheria and gave the instructions to obtain the material from the child's pharynx and isolate a pure culture of the causative agent. What is crucial in this case for the confirmation of the diagnosis?

A. Toxigenicity test
B. Detection of volutine granules in the causative agent
C. Cystinase test
D. Hemolytic ability of the pathogen
E. Phagolysability

69. A person at rest presents with significantly increased work of the inspiratory muscles. What can cause this phenomenon?

A. Narrowing of the respiratory tract
B. Shallow breathing
C. Slow breathing
D. Negative intrapleural pressure
E. Reduced minute ventilation

70. In some diseases, changes occur in the cells, with lysosomal membrane integrity becoming impaired in the process. What changes will occur in the cells as a result?

A. Autolysis
B. Impaired mitosis
C. Impaired translation
D. Impaired transcription
E. Accumulation of substances

71. As a result of acute kidney failure, a man developed oliguria. What 24-hour urine outpit corresponds with this symptom?

A. 100–500 mL
B. 1500–2000 mL
C. 1000–1500 mL
D. 500–1000 mL
E. 50–90 mL

72. Autopsy of the body of a 59-year-old woman, who had a long history of essential hypertension, shows that both her kidneys are dense and significantly reduced in size and have a fine-grained surface. What is indicated by these changes?

A. Atrophy caused by insufficient blood supply
B. Atrophy caused by pressure
C. Senile atrophy
D. Dysfunctional atrophy
E. Hypoplasia

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

74. What changes in hemocoagulation processes will occur in a person, if activity of the sympathetic nervous system increases?

A. Hemocoagulation will increase
B. Hemocoagulation will decrease
C. Hemocoagulation will remain unchanged
D. Anticoagulant system will activate
E. Fibrinolysis will decrease

75. Examination detected phenylpyruvic

acid in patient's urine and elevated phenylalanine levels in the blood. The patient was diagnosed with phenylketonuria. What method can be used to confirm this diagnosis?

A. Biochemical method
B. Cytogenetics
C. Twin study
D. Genealogical method
E. Population statistics

76. Examination of an 18-year-old girl detects the following: underdeveloped ovaries, broad shoulders, narrow pelvis, shortened legs, "neck of the sphinx", normal mental development. Provisionally, she was diagnosed with Turner syndrome. What method can be used to confirm this pathology?

A. Cytogenetics
B. Dermatoglyphics
C. Twin study
D. Genealogical method
E. Biochemical method

77. In a patient, the duration of the PQ interval in the ECG exceeds the norm, while the duration of the P wave remains normal. This phenomenon is caused by a decreased speed of excitation conduction in a certain structure. Name this structure.

A. Atrioventricular node
B. Sinoatrial node
C. His' bundle
D. His' bundle branches
E. Purkinje fibers

78. In practically healthy individuals, moderate physical exertion causes an increase in the systolic pressure and a slight decrease in the diastolic pressure. What causes such changes?

A. Increased force of cardiac contractions and relaxation of the arterioles due to the effect of lactic acid
B. Increased tone of the arterioles and increased volume of the blood depot
C. Increased renin release due to a decreased blood supply to the kidneys
D. Increased volume of the circulating blood
E. Increased force and rate of cardiac contractions

79. A 30-year-old patient hospitalized with the diagnosis of acute glomerulonephritis has proteinuria. What disorder has caused this phenomenon?

A. Increased permeability of the glomerular membrane
B. Delayed excretion of the products of nitrogenous metabolism
C. Decreased oncotic blood pressure
D. Increased hydrostatic pressure on the capillary wall
E. Decreased number of functioning nephrons

80. A 14-year-old child has positive nitrogen balance. What is the likely cause of this condition in the child?

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

81. Measuring the transaminase activity is widely used to diagnose the damage to internal organs. The active form of a certain vitamin is a cofactor of these enzymes. Name this vitamin.

A. B_6
B. B_1
C. B_{12}
D. B_2
E. PP

82. Autopsy of the body of a man, who died of ethylene glycol poisoning, reveals that the kidneys are slightly enlarged and edematous and their capsule can be very easily removed. Their cortex is wide and pale gray, their medulla is dark red. What kidney pathology has developed in the patient?

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

83. In a patient with anemia, the levels of protoporphyrin IX increased in erythrocytes. What mineral element is deficient in this case, causing this pathology?

A. Iron
B. Phosphorus
C. Magnesium
D. Potassium
E. Sodium

84. A patient with chronic hepatitis presents with a significant decrease in the synthesis and secretion of bile acids. What process would be most disturbed in the intestine of this patient?

A. Emulsification of fats
B. Digestion of proteins
C. Digestion of carbohydrates
D. Glycerin absorption
E. Absorption of amino acids

85. A lymphocyte was infected with HIV (AIDS) retrovirus. What is the direction of information transmission in the cell in this case?

A. RNA > DNA > mRNA > polypeptide
B. DNA > mRNA > polypeptide > DNA
C. DNA > polypeptide > mRNA
D. mRNA > polypeptide > DNA
E. Polypeptide > RNA > DNA > mRNA

86. A test animal received a concentrated solution of sodium chloride intravenously, which caused a decrease in its reabsorption in the kidney tubules. This phenomenon can be caused by a change in the secretion of a certain hormone. Name this change.

A. Decreased secretion of aldosterone
B. Increased secretion of aldosterone
C. Decreased secretion of vasopressin
D. Increased secretion of vasopressin
E. Decreased secretion of natriuretic factor

87. A 45-year-old man has been hospitalized with complaints of fever, pain during breathing, dyspnea, and cough. Laboratory tests and X-ray allowed diagnosing him with pleurisy. A pleural puncture is prescribed to evacuate the exudate. Where in the pleural cavity can you find the largest amount of exudate?

A. Costodiaphragmatic recess
B. Phrenicomediastinal recess
C. Costomediastinal recess
D. Under the pleural dome
E. Under the root of the lungs

88. The mother of a 2-year-old boy brought him to a hospital complaining of enlargement of her child's scrotum. After examination, the child was diagnosed with hydrocele testis (fluid accumulation between the testicular membranes). What tunic of the testicle contains this fluid?

A. Tunica vaginalis
B. Tunica dartos
C. Tunica albuginea
D. External spermatic fascia
E. Internal spermatic fascia

89. During repeated exposure to ultraviolet rays, the skin darkens due to the synthesis of melanin in it, which protects cells from damage. What is the primary mechanism that activates this protection?

A. Activation of tyrosinase
B. Inhibition of tyrosinase
C. Activation of homogentisic acid oxidase
D. Inhibition of homogentisic acid oxidase
E. Inhibition of phenylalanine hydroxylase

90. A 32-year-old woman with a history of myocarditis on ECG presents with a heart rhythm disorder (non-sinus rhythm). What cardiomyocytes are dysfunctional in this case?

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

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

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

92. A 62-year-old man died of chronic kidney failure. Autopsy shows that the kidneys are reduced in size and dense, the fibrous capsule is difficult to remove, the surface is granular, and the cortical substance is thin. Histology detects proliferation of endothelial and mesangial cells in some glomeruli and thickening of glomerular capillary membranes. Some of the glomeruli are sclerosed and hyalinized. There are non-numerous lymphoid infiltrates in the stroma. What disease corresponds with such pathological changes?

A. Chronic glomerulonephritis
B. Arteriolosclerotic nephrosclerosis (primary shrunken kidney)
C. Atherosclerotic shrunken kidney
D. Acute extracapillary exudative glomerulonephritis
E. Pyelonephritis

93. 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. α-blockers
B. Calcium antagonists
C. β-blockers
D. Sympatholytics
E. Ganglionic blockers

94. 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. Biceps femoris muscle
C. Sartorius muscle
D. Adductor magnus muscle
E. Adductor longus muscle

95. The course of hemorrhagic shock in the patient was complicated by the development of acute kidney failure. What is the leading link in the development mechanism of this complication?

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

96. A 6-year-old child died of respiratory failure due to paralysis of the respiratory muscles. Histology of the thoracic spinal cord shows hyperemia, a smoothed out pattern of the gray matter, droplet hemorrhages, small concave areas of softened tissues, and inflammation with proliferation of neuroglia around dead neurons. What disease can be characterized by these pathological changes?

A. Poliomyelitis
B. Meningococcal infection
C. Cytomegaly
D. Toxoplasmosis
E. Adenovirus infection

97. A man has acute glomerulonephritis. In this pathology, the damage to the capillary basement membrane of the renal glomeruli is indicated by a certain substance that appears in urine. Name this substance.

A. Protein
B. Leukocytes
C. Glucose
D. Creatine
E. 17-Ketosteroids

98. A patient with alkaptonuria has signs of arthritis and ochronosis. What substance accumulates in the joints in this case, causing pain?

A. Homogentisates
B. Urates
C. Phosphates
D. Oxalates
E. Carbonates

99. A patient, who for a long time was on an imbalanced diet low in proteins, developed hepatic fatty infiltration. What substance was absent in the patient's diet, causing the development of this medical condition?

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

100. A man had a bronchospasm attack. What membrane cytoreceptors of bronchial smooth muscles should be stimulated to improve the patient's condition?

A. β-adrenergic receptors
B. α-adrenergic receptors
C. Muscarinic acetylcholine receptors
D. Nicotinic acetylcholine receptors
E. H_2-histamine receptors

101. A man complains of an acute increase in diuresis (up to 5–7 liters of urine per 24 hours). Examination detects reduced vasopressin secretion. What cells have insufficient secretory activity in this case?

A. Neurosecretory cells of the hypothalamus
B. Endocrinocytes of the anterior pituitary
C. Endocrinocytes of the intermediate pituitary
D. Pituicytes
E. Cells of the pars tuberalis

102. During childbirth, the woman developed secondary weakness of labor activity. What drug must be administered in this case to restore the contractile activity of the myometrium?

A. Oxytocin
B. Dimedrol (Diphenhydramine)
C. Unithiol
D. Chlorpromazine
E. Suxamethonium

103. A woman gave birth to a stillborn child with maldevelopments. What protozoan disease could have caused the intrauterine infection of the fetus?

A. Toxoplasmosis
B. Trichomoniasis
C. Leishmaniasis
D. Malaria
E. Trypanosomiasis

104. 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. Hydrochloric acid
D. Na^+ salts
E. Pepsin

105. Antibiotics (streptomycin, erythromycin, chloramphenicol) are used to treat infectious bacterial diseases. What stage of protein synthesis in the microbial cell do they inhibit?

A. Translation
B. Transcription
C. Replication
D. Processing
E. Splicing

106. The breakdown of glycogen in the liver is stimulated by glucagon. What secondary messenger (intermediary) forms in the cell in this case?

A. cAMP
B. cGMP
C. Carbon monoxide
D. Nitrous oxide
E. Diacylglycerol

107. A tricuspid valve defect was detected in a patient. Where is it located?

A. Between the right atrium and right ventricle
B. Between the left atrium and left ventricle
C. Aortic opening
D. Opening of the pulmonary trunk
E. Opening of the coronary sinus

108. Autopsy shows that the lung tissue looks like a honeycomb because of bag-like and cylindrical expansions of the bronchi. Microscopically, leukocyte infiltration with the predominance of neutrophils is observed in the wall of the affected bronchi. Elastic muscle fibers and cartilaginous plates are partially destroyed and replaced with connective tissue. Adjacent lung tissue has inflammation foci, areas of fibrosis and sclerosis of vessels, and signs of emphysema. Hypertrophy of the right ventricle is observed in the heart. What disease can be characterized by these pathological changes?

A. Multiple bronchiectasis
B. Pulmonary emphysema
C. Interstitial pneumonia
D. Pneumofibrosis
E. Chronic bronchitis

109. A hypertensive crisis occurred in a 68-year-old woman with a long history of essential hypertension. What drug should be prescribed in this case as hypotensive therapy?

A. Magnesium sulfate
B. Nitroglycerin
C. Metoprolol
D. Heparin
E. Isadrinum (Isoprenaline)

110. A 55-year-old patient underwent a kidney transplantation. What immunotropic agent should be prescribed in this case?

A. Prednisolone
B. Thymus extract
C. γ- globulin
D. Sodium nucleinate
E. Levamisole

111. A man with bronchial asthma has been taking prednisolone for a long time. What is the mechanism of action of this drug?

A. Inhibition of phospholipase A_2 activity
B. Blockade of histamine receptors
C. Blockade of leukotriene receptors
D. Blockade of sodium channels
E. Inhibition of dihydrofolate reductase activity

112. A doctor prescribed sodium valproate as an antiepileptic agent to a patient with grand mal seizures. What is the mechanism of action of this drug?

A. Blocks sodium channels and increases GABA levels in the brain
B. Blocks calcium channels and increases dopamine levels in the brain
C. Increases the activity of hippocampal neurons
D. Changes the activity of serotonin receptors
E. Activates the cholesterol catabolism

113. Tubocurarine chloride was used during dislocation reduction in a patient. Soon the patient developed overdose symptoms. What drug should be used to eliminate these symptoms?

A. Prozerin (Neostigmine)
B. Furosemide
C. Omeprazole
D. Dithylin (Suxamethonium)
E. Morphine

114. A doctor prescribed an analgesic to a patient for toothache relief. This analgesic does not irritate the lining of the alimentary canal and has no ulcerogenic effect. Name this drug.

A. Paracetamol
B. Phenylbutazone
C. Acetylsalicylic acid
D. Ibuprofen
E. Naproxen

115. A 63-year-old patient develops angina pectoris attacks during physical exertion. What group of drugs should be prescribed for their prevention?

A. Antianginal drugs
B. Cardiotonics
C. Respiratory stimulants
D. Antiarrhythmic drugs
E. Antihypertensive drugs

116. A patient developed arterial hypertension, tachyarrhythmia, and persistent disturbances of blood circulation in the heart muscle. What drug should be prescribed for a patient with such a pathology?

A. Metoprolol
B. Nikethamide
C. Nitroglycerin
D. Salbutamol
E. Medazepam

117. A patient has a head injury, accompanied by arterial bleeding in the area of the parietal bone. What branch of the external carotid artery supplies this area with blood?

A. *A. temporalis superficialis*
B. *A. occipitalis*
C. *A. facialis*
D. *A. maxillaris*
E. *A. auricularis posterior*

118. The only indication for narcotic analgesics (morphine, trimeperidine) is acute intense pain that is life-threatening for the patient. Why does this group of drugs have such limited indications for practical use?

A. Drug addiction
B. Hypersensitivity
C. Cumulation
D. Sensitization
E. Potentiation

119. A newborn with asphyxia was administered a drug for direct stimulation of the respiratory center. This drug has an anti-inflammatory, anti-allergic, and broncholytic effects. It also inhibits the cerebral cortex and does not cause seizures. What drug has such characteristics?

A. Aethimizolum
B. Bemegride
C. Camphor
D. Lobeline
E. Nikethamide

120. The spleen is known to be a "graveyard of erythrocytes". What happens to the erythrocytes of the red pulp, when they die?

A. Become absorbed by macrophages
B. Enter the bloodstream
C. Become absorbed by neutrophilic leukocytes
D. Accumulate in the red pulp
E. Undergo lysis by the enzymes of foreign-body giant cells

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

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

122. A woman with I (O) Rh- blood group married a man with IV (AB) Rh+ blood group. What blood type and Rh factor can be expected in the children of this couple (excluding the Bombay phenotype)?

A. III (B) Rh+
B. I (O) Rh-
C. IV (AB) Rh+
D. I (O) Rh+
E. IV (AB) Rh-

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

124. 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

125. The causative agent of tuberculosis can exist both intracellularly and extracellularly, as well as in caseous necrosis. What drug can have a harmful effect on *Mycobacterium tuberculosis* of any localization?

A. Rifampicin
B. Streptomycin
C. Isoniazid
D. Ethambutol
E. Sodium aminosalicylate

126. When performing an anterior median incision on the skin and fascia of the neck for an urgent tracheotomy, the doctor should keep in mind that there is a risk of damaging the following blood vessel:

A. *Arcus venosus juguli*
B. *V. jugularis externa*
C. *V. jugularis interna*
D. *V. facialis*
E. *V. thyroidea media*

127. A man has developed fatty liver disease as a result of alcohol abuse. What link of lipid metabolism is impaired in this case?

A. β-oxidation of lipids
B. Absorption of fats
C. Transportation of fats
D. Metabolism of fats in adipose tissue
E. Intermediate metabolism of lipids

128. A patient is allergic to pollen. How should the specific hyposensitization of the body be carried out?

A. Repeated introduction of small doses of the allergen, with gradually increasing doses
B. Administration of corticosteroid drugs
C. Administration of an anesthetic
D. Administration of an antispasmodic drug
E. Repeated introduction of large doses of the allergen, with gradually reducing doses

129. A 50-year-old woman developed hemolytic anemia after mushroom poisoning. Where will the hemolysis of erythrocytes primarily occur in this case?

A. Bloodstream
B. Liver and spleen
C. Kidneys
D. Bone marrow
E. Lymphoid tissue

130. In an experiment, pluripotent embryonic stem cells were obtained from a human blastocyst. Over the course of the next several months, they formed millions of new cells in a nutrient medium at the laboratory. What is the name of the process of multiple cell renewal?

A. Proliferation
B. Differentiation
C. Repair
D. Apoptosis
E. Maturation

131. The number of ATP molecules, formed as a result of the oxidation of various substrates in the mitochondrial respiratory chain, is determined by the value of the oxidative phosphorylation coefficient. How is it calculated?

A. P/O
B. ATP/ADP
C. CO_2/O_2
D. ATP/(ADP+AMP)
E. AMP+ADP

132. A patient underwent a study of the secretory activity of the stomach to clarify the diagnosis of achilia. What pathological component of gastric juice can be detected in this case?

A. Lactate
B. Pepsin
C. Gastrixin
D. Renin
E. Pyruvate

133. A patient diagnosed with acute respiratory failure underwent artificial lung ventilation at a high partial pressure of oxygen, as a result of which the patient's

condition became worse and the patient developed a respiratory distress syndrome. What is the likely cause of this complication?

A. Intensive oxidation of lung surfactant
B. Inflammatory process
C. Fibrosis
D. Atelectasis
E. Blood stasis in the lungs

134. A patient, who works in an underground mine, has developed pulmonary fibrosis. What can be detected by spirometric testing in this case?

A. Decreased vital capacity of the lungs
B. Increased vital capacity of the lungs
C. Increased airway resistance
D. Decreased airway resistance
E. Normal airway resistance

135. A mature messenger RNA molecule is shorter than its corresponding gene in the DNA molecule. Non-informative pro-mRNA nucleotide sequences are removed during the processing. These non-informative sequences are called:

A. Introns
B. Exons
C. Mutons
D. Transcriptons
E. Clusters

136. A man has been diagnosed with pellagra. In what type of reactions does vitamin PP play an important role?

A. Dehydrogenation
B. Hydroxylation
C. Decarboxylation
D. Deamination
E. Transamination

137. Biotin plays an important role in the metabolism of carbohydrates and lipids. In what type of reactions does it take part?

A. Carboxylation
B. Hydroxylation
C. Decarboxylation
D. Deamination
E. Transamination

138. During examination, auscultation detects that the first heart sound is heard better than the second one in the V intercostal space on the left, 1–2 cm laterally from the midclavicular line. What valve closes, causing this phenomenon?

A. Left bicuspid valve
B. Aortic semilunar valve
C. Right tricuspid valve
D. Bicuspid and tricuspid valves
E. Pulmonary semilunar valve

139. During immediate allergic reactions, degranulation of basophilic granulocytes that secrete bioactive substances occurs. Select from the list one such substance.

A. Serotonin
B. Acetylcholine
C. Hageman factor
D. Thromboxane
E. Lymphokines

140. After a compression bandage was applied to a hand injury, the patient developed edema of the fingers, cyanosis, and a decrease in the skin temperature. What type of peripheral circulatory disorder has caused these phenomena?

A. Venous hyperemia
B. Ischemic stasis
C. Thrombosis
D. Ischemia
E. Postischemic arterial hyperemia

141. Gluconeogenesis reactions use phosphoenolpyruvate formed from oxaloacetate. Oxaloacetate is synthesized by pyruvate carboxylase in mitochondria. What shuttle system transports this metabolite into the cytoplasm?

A. Malate shuttle system
B. Lactate shuttle system
C. Glycerol phosphate shuttle system
D. Carnitine shuttle system
E. Alanine shuttle system

142. A 26-year-old patient complains of muscle pain, seizures, muscle weakness, and red urine, observed after minor physical exertion. Muscle biopsy detected accumulation of glycogen in the muscles. No changes were detected during liver biopsy. What disease is most likely in the patient?

A. McArdle disease
B. Hartnup disease
C. Von Gierke disease
D. Maple syrup urine disease
E. Niemann-Pick disease

143. A 22-year-old woman came to a dermatologist with complaints of a purulent rash on her face and back. Her medical record indicates a *H. pylori* infection. Taking into account this concomitant pathology, the doctor prescribed her an

antibacterial drug that would be effective both against the pathogens of soft tissue infections and against *H. pylori*. What antibacterial drug did the doctor prescribe?

A. Clarithromycin
B. Rifampicin
C. Fluconazole
D. Oseltamivir
E. Isoniazid

144. Inhibition of nociceptive information occurs with the participation of many mediators, except:

A. Glutamate
B. Endorphin
C. GABA
D. Serotonin
E. Noradrenaline

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

146. Based on the results of ECG analysis, it is necessary to determine the pacemaker of the heart. It can be done by determining:

A. The direction of the P wave
B. The direction of the Q wave
C. The direction of the R wave
D. The amplitude of the P wave
E. The amplitude of the R wave

147. A patient diagnosed with an acute myocardial infarction has been prescribed an anticoagulant therapy. What indicator of the blood coagulation system must be measured, when taking heparin, to prevent possible complications caused by its overdose?

A. Prothrombin time
B. Activated partial thromboplastin time
C. International normalized ratio
D. Fibrinogen concentration
E. ESR

148. Acetylsalicylic acid and glucocorticoids both have a marked anti-inflammatory effect. However, unlike glucocorticoids, acetylsalicylic acid has no effect on the synthesis of the following bioactive substances:

A. Leukotrienes
B. Thromboxanes
C. Prostaglandins E
D. Prostacyclins
E. Prostaglandins *F*

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

150. Excessive formation of free radicals causes cell damage. Name the non-enzymatic factor of the cellular antioxidant defense system.

A. Vitamin *E*
B. Superoxide dismutase
C. Glutathione reductase
D. Glucuronidase
E. Cyanocobalamin