

"Step-1" Test Questions on Pathophysiology

(*The correct answer in each question is **variant A**)

Module 1

1. 27-year-old woman has used penicillin containing eye drops. In a few minutes itching, skin burning, lips and eyelids edema, whistling cough, decreasing BP appeared. What antibodies can lead to this allergic reaction?
 - A. IgE and IgG
 - B. IgM and IgG
 - C. IgA and IgM
 - D. IgM and IgD
 - E. IgG and IgD
2. An individual is characterized by rounded face, broad forehead, a mongolian type of eyelid fold, flattened nasal bridge, permanently open mouth, projecting lower lip, protruding tongue, short neck, flat hands, and stubby fingers. What diagnosis can be put to the patient?
 - A. Down's syndrome
 - B. Klinefelter's syndrome
 - C. Alkaptonuria
 - D. Supermales
 - E. Turner's syndrome
3. A patient visited a dentist with complaints of redness and edema of his mouth mucous membrane in a month after dental prosthesis. The patient was diagnosed with allergic stomatitis. What type of allergic reaction by Gell and Cumbs underlies this disease?
 - A. Delayed type hypersensitivity
 - B. Cytotoxic
 - C. Immunocomplex
 - D. Anaphylactic
 - E. Stimulating
4. A patient with clinical signs of immunodeficiency has unchanged number and functional activity of T and B lymphocytes. Dysfunction's defect of antigen-presentation to the immunocompetent cells was found during investigation on the molecule level. Defect of what cells is the most probable here?
 - A. Macrophages, monocytes
 - B. T-lymphocytes, B-lymphocytes
 - C. NK-cells
 - D. Fibroblasts, T-lymphocytes, B-lymphocytes
 - E. 0-lymphocytes
5. The preventive radioprotector was given to a worker of a nuclear power station. What mechanism from the below mentioned is considered to be the main mechanism of radioprotection?
 - A. Inhibition of free radicals formation
 - B. Prevention of tissue's hypoxia
 - C. Activation of oxidation reactions
 - D. Increasing of tissue blood supply
 - E. Increasing of respiration

6. At the laboratory experiment the eukocyte culture was mixed with staphylococci. Neutrophile leukocytes engulfed and digested bacterial cells. This processes are termed:
- A. Phagocytosis
 - B. Pinocytosis
 - C. Diffusion
 - D. Facilitated diffusion
 - E. Osmosis
7. A damage of the atomic power plant reactor resulted in the runout of radioelements. People in the superstandard radiation zone were radiated with approximately 250-300 r. and were immediately hospitalized. What changes in the blood count would be typical?
- A. Lymphopenia
 - B. Leukopenia
 - C. Anemia
 - D. Thrombopenia
 - E. Neutropenia
8. Part of the DNA chain turned about 180 degrees due to gamma radiation. What type of mutation took place in the DNA chain?
- A. Inversion
 - B. Deletion
 - C. Doubling
 - D. Translocation
 - E. Replication
9. Analysis of blood serum of a patient revealed increase of alanine aminotransferase and aspartate aminotransferase level. What cytological changes can cause such a situation?
- A. Cellular breakdown
 - B. Disturbed function of energy supply of cells
 - C. Disorder of enzyme systems of cells
 - D. Disturbance of genetic apparatus of cells
 - E. Disturbance of cellular interrelations
10. In some regions of South Africa there is a spread sickle-shaped cell anemia, in which erythrocytes have shape of a sickle as a result of substitution of glutamin by valine in the hemoglobin molecule. What is the cause of this disease?
- A. Gene mutation
 - B. Disturbance of mechanisms of genetic information realization
 - C. Crossingover
 - D. Genomic mutations
 - E. Transduction
11. Having helped to eliminate consequences of a failure at a nuclear power plant, a worker got an irradiation doze of 500 roentgen. He complains of headache, nausea, dizziness. What changes in leukocytes quantity can be expected 10 hours after irradiation?
- A. Neutrophilic leukocytosis
 - B. Lymphocytosis
 - C. Leukopenia
 - D. Agranulocytosis
 - E. Leukemia

12. Autopsy of a newborn boy revealed polydactyilia, microcephalia, cheiloschisis and uranoschisis as well as hypertrophy of parenchimatous organs. These defects correspond with the description of Patau's syndrome. What is the most probable cause of this pathology?

- A. Trisomy of the 13th chromosome
- B. Trisomy of the 18th chromosome
- C. Trisomy of the 21st chromosome
- D. Nondisjunction of sex chromosomes
- E. Partial monosomy

13. A woman has been applying a new cosmetic preparation for a week that resulted in eye-lid inflammation accompanied by hyperemia, infiltration and painfulness. What type of allergic reaction was developed?

- A. IV
- B. I
- C. II
- D. III
- E. V

14. In course of histidine catabolism a biogenic amin is formed that has powerful vasodilatating effect. Name it:

- A. Histamine
- B. Serotonin
- C. Dioxyphenylalanine
- D. Noradrenalin
- E. Dopamine

15. An experimental animal was first sensibilized whereupon an antigen dose was introduced subcutaneously. This injection resulted in the development of a fibrinous inflammation with alteration of vessel walls, basal substance and fibrous structures of connective tissue in form of mucoid and fibrinoid swelling and necrosis. What immunological reaction took place?

- A. Immediate hypersensitivity
- B. Delayed-type hypersensitivity
- C. Reaction of transplantation immunity
- D. Normergic reaction
- E. Granulomatosis

16. A 38 year old patient suffers from rheumatism in its active phase. What laboratory characteristic of blood serum is of diagnostic importance in case of this pathology?

- A. C-reactive protein
- B. Uric acid
- C. Urea
- D. Creatinine
- E. Transferrin

17. Continuous taking of some drugs foregoing the pregnancy increase the risk of giving birth to a child with genetic defects. What is this effect called?

- A. Mutagenic effect
- B. Embryotoxic effect
- C. Teratogenic effect
- D. Fetotoxic effect
- E. Blastomogenic effect

18. There are several groups of molecular mechanisms playing important part in pathogenesis of insult to cells which contributes to the pathology development. What processes are stimulated by proteinic damage mechanisms?
- A. Enzyme inhibition
 - B. Lipid peroxidation
 - C. Phospholipase activation
 - D. Osmotic membrane distension
 - E. Acidosis
19. A child was born with cleft palate. Examination revealed aorta defects and reduced number of T-lymphocytes in blood. What immunodeficient syndrome is it?
- A. DiGeorge
 - B. Wiskott-Aldrich
 - C. Chediak-Higashi
 - D. Louis-Bar
 - E. Swiss-type
20. Examination of a 12 year old boy with developmental lag revealed achondroplasia: disproportional constitution with evident shortening of upper and lower limbs as a result of growth disorder of epiphyseal cartilages of long tubal bones. This disease is:
- A. Inherited, dominant
 - B. Inherited, recessive
 - C. Inherited, sex-linked
 - D. Congenital
 - E. Acquired
21. A 30 year old woman has applied a lipstick with a fluorescent substance for a long time. Then she got a limited erythema and slight peeling on her lip border, later there appeared transversal striae and cracks. Special methods of microscopic examination of the affected area helped to reveal sensibilized lymphocytes and macrophages in the connective tissue; cytolysis. What type of immunological hypersensitivity was developed?
- A. IV type (cellular cytotoxicity)
 - B. I type (reaginic)
 - C. II type (antibody cytotoxicity)
 - D. III type (immune complex cytotoxicity)
 - E. Granulomatosis
22. As a result of prophylactic medical examination a 7 year old boy was diagnosed with Lesch-Nyhan syndrome (only boys fall ill with it). The boy's parents are healthy but his grandfather by his mother's side suffers from the same disease. What type of disease inheritance is it?
- A. Recessive, sex-linked
 - B. Dominant, sex-linked
 - C. Autosomal recessive
 - D. Autosomal dominant
 - E. Semidominance
23. A man suffering from a hereditary disease married a healthy woman. They got 5 children, three girls and two boys. All the girls inherited their father's disease. What is the type of the disease inheritance?
- A. Dominant, X-linked
 - B. Autosomal recessive
 - C. Autosomal dominant

- D. Y-linked
- E. Recessive, X-linked

24. A female patient suffering from bronchial asthma had got a viral infection that provoked status asthmaticus with fatal outcome. Histological examination of lungs revealed spasm and edema of bronchioles, apparent infiltration of their walls with lymphocytes, eosinophils and other leukocytes; labrocyte degranulation. What mechanism of hypersensitivity underlies the described alterations?

- A. Reagin reaction
- B. Inflammatory
- C. Autoimmune
- D. Immune complex
- E. Immune cytolysis

25. Medical examination at the military registration and enlistment office revealed that a 15-year-old boy was high, with eunuchoid body proportions, gynecomastia, female pattern of pubic hair distribution. The boy had also fat deposits on the thighs, no facial hair, high voice, subnormal intelligence quotient. Which karyotype corresponds with this disease?

- A. 47, XXY
- B. 45, XO
- C. 46, XX
- D. 46, XY
- E. 47, XXX

26. During a prophylactic medical examination a 7-year-old boy was diagnosed with daltonism. His parents are healthy and have normal colour vision, but his grandfather on his mother's side has the same abnormality. What is the type of the abnormality inheritance?

- A. Recessive, sex-linked
- B. Dominant, sex-linked
- C. Semidominance
- D. Autosomal recessive
- E. Autosomal dominant

27. A 10-year-old child had the mantoux tuberculin test administered. 48 hours later a papule up to 8 mm in diameter appeared on the site of the injection. What type of hypersensitivity reaction developed after the tuberculin injection?

- A. Type IV hypersensitivity reaction
- B. Arthus phenomenon
- C. Seroreaction
- D. Atopic reaction
- E. Type II hypersensitivity reaction

28. After the prior sensibilization an experimental animal was given a subcutaneous injection of an antigen. The place of injection exhibited a fibrinous inflammation with alteration of the vessel walls, basal substance and fibrous structures of the connective tissue in form of mucoid and fibrinoid swelling and necrosis. What immunological reaction is it?

- A. Immediate hypersensitivity
- B. Delayed-type hypersensitivity
- C. Reaction of transplantation immunity
- D. Normergic reaction
- E. Granulomatosis

29. Examination of a patient revealed autoimmune haemolytic anaemia (cytotoxic type). What substances act as antigens in the II-type allergic reactions?
- A. Modified receptors of cell membranes
 - B. Antibiotics
 - C. Hormones
 - D. Serum proteins
 - E. Inflammation modulators
30. A 28-year-old female patient consulted a gynecologist about sterility. Examination revealed underdeveloped ovaries and uterus, irregular menstrual cycle. Analysis of the sex chromatin revealed 2 Barr's bodies in most somatic cells. What chromosome disease is most likely?
- A. Triple X syndrome
 - B. Edwards' syndrome
 - C. Patau's syndrome
 - D. Klinefelter's syndrome
 - E. Turner's syndrome
31. 48 hours after tuberculin test (Mantoux test) a child had a papule 10 mm in diameter on the spot of tuberculin injection. What hypersensitivity mechanism underlies these changes?
- A. Cellular cytotoxicity
 - B. Anaphylaxy
 - C. Antibody-dependent cytotoxicity
 - D. Immunocomplex cytotoxicity
 - E. Granulomatosis
32. A couple had a child with Down's disease. Mother is 42 years old. This disease is most probably caused by the following impairment of prenatal development:
- A. Gametopathy
 - B. Blastopathy
 - C. Embryopathy
 - D. Non-specific fetopathy
 - E. Specific fetopathy
33. Examination of a child who frequently suffers from infectious diseases revealed that IgG concentration in blood serum was 10 times less than normal, IgA and IgM concentration was also significantly reduced. Analysis showed also lack of B-lymphocytes and plasmocytes. What disease are these symptoms typical for?
- A. Bruton's disease
 - B. Swiss-type agammaglobulinemia
 - C. Dysimmunoglobulinemia
 - D. Louis-Bar syndrome
 - E. Di George syndrome
34. A patient with skin mycosis has disorder of cellular immunity. The most typical characteristic of it is reduction of the following index:
- A. T-lymphocytes
 - B. Immunoglobulin G
 - C. Immunoglobulin E
 - D. B-lymphocytes
 - E. Plasmocytes

35. A female patient underwent liver transplantation. 1,5 month after it her condition became worse because of reaction of transplant rejection. What factor of immune system plays the leading part in this reaction?
- A. T-killers
 - B. Interleukin-1
 - C. Natural killers
 - D. B-lymphocytes
 - E. T-helpers
36. An alcoholic woman has born a girl with mental and physical developmental lag. Doctors diagnosed the girl with fetal alcohol syndrome. What effect is the cause of the girl's state?
- A. Teratogenic
 - B. Mutagenic
 - C. Malignization
 - D. Carcinogenic
 - E. Mechanic
37. A 50 year old man who was referred to the hospital for treatment of cervical lymphadenitis underwent test for individual sensitivity to penicillin. 30 seconds after he went hot all over, AP dropped down to 0 mm Hg that led to cardiac arrest. Resuscitation was unsuccessful. Autopsy results: acute venous plethora of internal organs; histological examination of skin (from the site of injection) revealed degranulation of mast cells (tissue basophils). Degranulation was also revealed in myocardium and lungs. What type of hypersensitivity reaction is it?
- A. Anaphylactic
 - B. Delayed-type hypersensitivity
 - C. Complement-mediated cytotoxic
 - D. Immunocomplex-mediated
 - E. –
38. Cytogenetic examination of a patient with reproductive dysfunction revealed normal karyotype 46XY in some cells, but most cells have karyotype of Klinefelter's syndrome - 47 XXY. Such cell heterogeneity is called:
- A. Mosaicism
 - B. Inversion
 - C. Transposition
 - D. Duplication
 - E. Monomorphism
39. A 10-year-old child had the mantoux tuberculin test administered. 48 hours later a papule up to 8 mm in diameter appeared on the site of the injection. What type of hypersensitivity reaction developed after the tuberculin injection?
- A. Type IV hypersensitivity reaction
 - B. Arthus phenomenon
 - C. Seroreaction
 - D. Atopic reaction
 - E. Type II hypersensitivity reaction
40. Examination of a pregnant woman having Rh-negative blood revealed high level of antierythrocytic antibodies. For its reduction she was implanted with her husband's Rh-positive skin graft. The graft was rejected in two weeks. Its microscopic examination revealed circulatory disturbance, edema and cellular infiltration with lymphocytes, neutrophils and macrophages predominance. What is the most likely pathology?

- A. Graft immunity
- B. Immediate hypersensitivity
- C. Delayed-type hypersensitivity
- D. Granulomatous inflammation
- E. Interstitial inflammation

41. A 38-year-old male patient has been ill with systemic lupus erythematosus for three years. He was diagnosed with diffuse renal affection accompanied by massive edemata and expressive proteinuria. What is the most likely cause of proteinuria development?

- A. Autoimmune renal affection
- B. Aseptic renal affection
- C. Ischemic renal affection
- D. Urinary bladder inflammation
- E. Urinary tracts inflammation

42. Blood plasma of a healthy man contains several dozens of proteins. During an illness new proteins can originate, namely the protein of "acute phase". Select such protein from the listed below:

- A. C-reactive protein
- B. Prothrombin
- C. Fibrinogen
- D. G immunoglobulin
- E. A immunoglobulin

43. During surgical manipulations a patient has been given novocaine injection for anesthesia. 10 minutes later the patient developed paleness, dyspnea, hypotension. What type of allergic reaction is it?

- A. Anaphylactic immune reaction
- B. Cellulotoxic immune reaction
- C. Aggregate immune reaction
- D. Stimulating immune reaction
- E. Cell-mediated immune reaction

44. A child with a history of frequent angine and pharyngitis has been diagnosed with lymphadenopathy and splenomegaly. His appearance is characterised by pastosity and paleness, muscular tissue is poorly developed. Lymphocytosis is present. What kind of diathesis is it?

- A. Lymphohypoplastic diathesis
- B. Exudative diathesis
- C. Gouty diathesis
- D. Asthenic diathesis
- E. Hemorrhagic diathesis

45. After an immunoassay a child was diagnosed with immunodeficiency of humoral immunity. What is the reason for the primary immunodeficiency development in the child?

- A. Hereditary abnormality of immune system
- B. Embryonal development abnormalities
- C. Pathometabolism in mother's organism
- D. Immune responsiveness and resistance disorders
- E. Toxic damage of B-lymphocytes

46. A 22-year-old woman consulted a gynecologist about sterility. Examination revealed underdeveloped ovaries and uterus, irregular menstrual cycle. Analysis of the sex chromatin revealed 2 Barr's bodies in most somatic cells. What chromosome disease is most likely?
- A. Triple X syndrome
 - B. Edwards' syndrome
 - C. Patau's syndrome
 - D. Klinefelter's syndrome
 - E. Turner's syndrome
47. Sex chromosomes of a woman didn't separate and move to the opposite poles of a cell during gametogenesis (meiosis). The ovum was impregnated with a normal spermatozoon. Which chromosomal disease can be found in her child?
- A. Turner's syndrome
 - B. Down's syndrome
 - C. Patau's syndrome
 - D. Edwards' syndrome
 - E. Cat cry syndrome
48. A man suffering from a hereditary disease married a healthy woman. They got 5 children, three girls and two boys. All the girls inherited their father's disease. What is the type of the disease inheritance?
- A. Dominant, X-linked
 - B. Autosomal recessive
 - C. Autosomal dominant
 - D. Y-linked
 - E. Recessive, X-linked
49. A couple has a son with haemophilia. The parents are healthy but the maternal grandfather also has haemophilia. Specify the type of inheritance:
- A. Recessive sex-linked
 - B. Recessive autosomal
 - C. Dominant sex-linked
 - D. Semidominance
 - E. Autosomal dominant
50. 46 chromosomes were revealed on karyotype examination of the 5 year old girl. One of the 15th pair of chromosomes is longer than usual due to connected chromosome from the 21 pair. What type of mutation does this girl have?
- A. Translocation
 - B. Deletion
 - C. Inversion
 - D. Insufficiency
 - E. Duplication
51. Having helped to eliminate consequences of a failure at a nuclear power plant, a worker got an irradiation dose of 500 roentgen. He complains of headache, nausea, dizziness. What changes in leukocytes quantity can be expected 10 hours after irradiation?
- A. Neutrophilic leukocytosis
 - B. Lymphocytosis
 - C. Leukopenia
 - D. Agranulocytosis
 - E. Leukemia

52. A man with a long-term history of bronchial asthma died from asphyxia. Histological examination of his lungs revealed that the lumens of bronchioles and minor bronchi contained a lot of mucus with some eosinophils. There was also sclerosis of interalveolar septa, dilatation of alveole lumens. What mechanism accounts for the development of hypersensitivity reaction?

- A. Reagine reaction
- B. Cytotoxic reaction
- C. Immune complex reaction
- D. Lymphocyte-mediated cytotoxicity
- E. Granulomatosis

53. A 10 year old child had the mantoux tuberculin test administered. 48 hours later a papule up to 8 mm in diameter appeared on the site of the injection. What type of hypersensitivity reaction developed after the tuberculin injection?

- A. Type IV hypersensitivity reaction
- B. Arthus phenomenon
- C. Seroreaction
- D. Atopic reaction
- E. Type II hypersensitivity reaction

54. According to the phenotypic diagnosis a female patient has been provisionally diagnosed with X-chromosome polysomia. This diagnosis can be confirmed by a cytogenetic method. What karyotype will allow to confirm the diagnosis?

- A. 47(XXX)
- B. 48(XXXY)
- C. 48(XXYY)
- D. 47(XXY)
- E. 46(XX)

55. A patient has been diagnosed with acute glomerulonephritis that developed after he had had streptococcal infection. It is most likely that the affection of basal glomerular membrane is caused by an allergic reaction of the following type:

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

56. Examination of patients with periodontitis revealed the interdependence between the rate of affection of periodontal tissues and the amount of lysozymes in saliva and gingival liquid. These results can be obtained during studying the following protection system of an organism:

- A. Non-specific resistance
- B. Humoral immunity
- C. Cellular immunity
- D. Autoresponsiveness
- E. Tolerance

57. A 33 year old male died from disseminated tuberculosis. On autopsy the symptoms of tuberculosis were confirmed by both microscopical and histological analyses. All the affected organs had epithelioid cell granulomas with caseous necrosis in the centre. What kind of hypersensitivity reaction underlies the process of granuloma development?

- A. Delayed

- B. Antibody-dependent cytotoxicity
- C. Complement-dependent cytotoxicity
- D. Anaphylactic
- E. Immune complex

58. A child with suspected tuberculosis was given Mantoux test. After 24 hours the site of the allergen injection got swollen, hyperemic and painful. What are the main components that determine such response of the body?

- A. Mononuclear cells, T-lymphocytes and lymphokines
- B. Granulocytes, T-lymphocytes and IgG
- C. Plasma cells, T-lymphocytes and lymphokines
- D. B-lymphocytes, IgM
- E. Macrophages, B-lymphocytes and monocytes

59. Examination of an 15-year-old girl revealed the following features: hypoplasia of the ovaries, broad shoulders, narrow pelvis, shortening of the lower extremities, "sphinx neck". Mental development is normal. The girl was diagnosed with Turner's syndrome. What kind of chromosome abnormality is it?

- A. Monosomy X
- B. Trisomy X
- C. Trisomy 13
- D. Trisomy 18
- E. Nullisomy X

60. A 33-year-old male patient has been referred by an andrologist for the genetic counselling for the deviations of physical and mental development. Objectively: the patient is tall, has asthenic constitution, gynecomastia, mental retardation. Microscopy of the oral mucosa cells revealed sex chromatin (single Barr body) in 30% of cells. What is the most likely diagnosis?

- A. Klinefelter syndrome
- B. DiGeorge syndrome
- C. Down syndrome
- D. Recklinghausen's disease
- E. Cushing pituitary basophilism

61. Amniocentesis revealed two sex chromatin bodies (Barr bodies) in each cell of the sample. What disease is this character typical for?

- A. Trisomy X
- B. Klinefelter syndrome
- C. Turner's syndrome
- D. Down's syndrome
- E. Patau syndrome

62. A male patient has been diagnosed with acute post-streptococcal glomerulonephritis. It is most likely that the lesion of the basement membrane of renal corpuscles was caused by the following allergic reaction:

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

63. A child cut his leg with a piece of glass while playing and was brought to the clinic for the injection of tetanus toxoid. In order to prevent the development of anaphylactic shock the serum was administered by Bezredka's method. What mechanism underlies this method of desensitization of the body?
- A. Binding of IgE fixed to the mast cells
 - B. Blocking the mediator synthesis in the mast cells
 - C. Stimulation of immune tolerance to the antigen
 - D. Stimulation of the synthesis of antigenspecific IgG
 - E. Binding of IgE receptors to the mast cells
64. An experiment proved that UV-irradiated skin cells of patients with xeroderma pigmentosum restore the native structure of DNA slower than the cells of healthy people due to the defect in repair enzyme. What enzyme takes part in this process?
- A. Endonuclease
 - B. RNA ligase
 - C. Primase
 - D. DNA polymerase
 - E. DNA gyrase
65. What condition may develop 15-30 minutes after re-administration of the antigen as a result of the increased level of antibodies, mainly IgE, that are adsorbed on the surface of target cells, namely tissue basophils (mast cells) and blood basophils?
- A. Anaphylaxis
 - B. Antibody-dependent cytotoxicity
 - C. Delayed-type hypersensitivity
 - D. Immune complex hyperresponsiveness
 - E. Serum sickness
66. 10 days after having quinsy caused by beta-hemolytic streptococcus a 4-year-old child exhibited symptoms of glomerulonephritis. What mechanism of glomerular lesion is most likely in this case?
- A. Immunocomplex
 - B. Cellular cytotoxicity
 - C. Anaphylaxis
 - D. Atopy
 - E. Antibody-dependent cell-mediated cytotoxicity
67. A 22-year-old woman ate some seafood. 5 hours later the trunk and the distal parts of limbs got covered with small itchy papules which were partially fused together. After one day, the rash disappeared spontaneously. Specify the hypersensitivity mechanism underlying these changes:
- A. Atopy (local anaphylaxis)
 - B. Systemic anaphylaxis
 - C. Cellular cytotoxicity
 - D. Immune complex hypersensitivity
 - E. Antibody-dependent cell-mediated cytotoxicity
68. A 3-year-old child had eaten some strawberries. Soon he developed a rash and itching. What was found in the child's leukogram?
- A. Eosinophilia
 - B. Hypolymphemia
 - C. Neutrophilic leukocytosis
 - D. Monocytosis

E. Lymphocytosis

69. A boy referred to a genetics clinic was found to have 1 drumstick in blood neutrophils. The boy is likely to have the following syndrome:

- A. Klinefelter's
- B. Down's
- C. Turner's
- D. Edwards'
- E. Trisomy X

70. The development of both immune and allergic reactions is based upon the same mechanisms of the immune system response to an antigen. What is the main difference between the immune and allergic reactions?

- A. Development of tissue lesion
- B. Amount of released antigen
- C. Antigen structure
- D. Routes by which antigens are delivered into the body
- E. Hereditary predisposition

71. Those organisms which in the process of evolution failed to develop protection from H_2O_2 can exist only in anaerobic conditions. Which of the following enzymes can break hydrogen peroxide down?

- A. Peroxidase and catalase
- B. Oxygenase and hydroxylase
- C. Cytochrome oxidase, cytochrome B5
- D. Oxygenase and catalase
- E. Flavin-dependent oxidase

72. Parents of 5-year-old child report him to have frequent colds that develop into pneumonias, presence of purulent rashes on the skin. Laboratory tests have revealed the following: absence of immunoglobulins of any type, and naked cells are absent from the lymph nodes punctate. What kind of immune disorder is it?

- A. X-linked hypogammaglobulinemia (Bruton type agammaglobulinemia)
- B. Autosomal recessive agammaglobulinaemia (Swiss type)
- C. Hypoplastic anemia
- D. Agranulocytosis
- E. Louis-Barr syndrome

73. During blood transfusion a patient has developed intravascular erythrocyte hemolysis. What kind of hypersensitivity does the patient have?

- A. II type (antibody-dependent)
- B. I type (anaphylactic)
- C. III type (immune complex)
- D. IV type (cellular cytotoxicity)
- E. IV type (granulomatosis)

74. In the course of puncture biopsy of transplanted kidney the following has been revealed: diffuse infiltration of stroma by lymphocytes and plasmocytes and necrotic arteritis. What pathological process has developed in the transplant?

- A. Immune rejection
- B. Ischemic kidney failure
- C. Glomerulonephritis

- D. Tubular necrosis
- E. Pyelonephritis

75. A 2-year-old boy is diagnosed with Down syndrome. What chromosomal changes may be the cause of this disease?

- A. Trisomy 21
- B. Trisomy 13
- C. Trisomy X
- D. Trisomy 18
- E. Monosomy X

76. A 30-year-old patient has dyspnea fits, mostly at night. He has been diagnosed with bronchial asthma. What type of allergic reaction according to the Gell-Coombs classification is most likely in this case?

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

77. Sex chromatin was detected during examination of a man's buccal epithelium. It is characteristic of the following chromosome disease:

- A. Klinefelter's syndrome
- B. Down's disease
- C. Turner's syndrome
- D. Triple X syndrome
- E. Hypophosphatemic rickets

78. A 12-year-old child has developed nephritic syndrome (proteinuria, hematuria, cylindruria) 2 weeks after the case of tonsillitis, which is a sign of affected glomerular basement membrane in the kidneys. What mechanism is the most likely to cause the basement membrane damage?

- A. Immune complex
- B. Granulomatous
- C. Antibody-mediated
- D. Reaginic
- E. Cytotoxic

79. Several minutes after a dentist administered novocaine for local anaesthesia of a patient's tooth, the following symptoms sharply developed in the patient: fatigue, skin itching. Objectively the following can be observed: skin hyperemia, tachycardia, BP dropped down to 70/40 mm Hg. What kind of allergic reaction is this pathology?

- A. Anaphylactic
- B. Cytotoxic
- C. Stimulating
- D. Cell-mediated immune reaction
- E. Immune complex

80. A 3-year-old boy is diagnosed with Down syndrome. What chromosomal changes may be the cause of this disease?

- A. Trisomy 21
- B. Trisomy 13
- C. Trisomy X

- D. Trisomy 18
- E. Monosomy X

81. The process of metabolism in the human body produces active forms of oxygen, including superoxide anion radical O_2^- . This anion is inactivated by the following enzyme:

- A. Superoxide dismutase
- B. Catalase
- C. Peroxidase
- D. Glutathione peroxidase
- E. Glutathione reductase

82. Sex chromatin was detected during examination of a man's buccal epithelium. It is characteristic of the following chromosome disease:

- A. Klinefelter's syndrome
- B. Down's disease
- C. Turner's syndrome
- D. Triple X syndrome
- E. Hypophosphatemic rickets

83. A 9-year-old child developed nephritic syndrome (proteinuria, hematuria, cylindruria) 2 weeks after a case of tonsillitis, which is a sign of affected glomerular basement membrane in the kidneys. What mechanism is the most likely to cause the basement membrane damage?

- A. Immune complex
- B. Granulomatous
- C. Antibody-mediated
- D. Reaginic
- E. Cytotoxic

84. What condition may develop 15-30 minutes after re-administration of an antigen as a result of the increased level of antibodies, mainly IgE, that are adsorbed on the surface of target cells, namely tissue basophils (mast cells) and blood basophils?

- A. Anaphylaxis
- B. Antibody-dependent cytotoxicity
- C. Delayed-type hypersensitivity
- D. Immune complex hyperresponsiveness
- E. Serum sickness

Module 2

1. A patient suffering from thrombophlebitis of deep veins suddenly died. The autopsy has shown freely lying red friable masses with dim crimped surface in the trunk and bifurcation of the pulmonary artery. What pathologic process was revealed by the morbid anatomist?
 - A. Thromboembolism
 - B. Thrombosis
 - C. Tissue embolism
 - D. Embolism with foreign body
 - E. Fat embolism
2. Decreased blood supply to the organs causes hypoxia that activates fibroblasts function. Volume of what elements is increased in this case?
 - A. Intercellular substance
 - B. Vessels of microcirculation
 - C. Nerve elements
 - D. Parenchymatous elements of the organ
 - E. Lymphatic vessels
3. The pulmonary embolism has suddenly developed in a 40 year-old patient with opened fracture of the hip. Choose the possible kind of embolism.
 - A. Fat
 - B. Thrombus-embolus
 - C. Air
 - D. Tissue
 - E. Foreign body
4. A 16-year-old boy was performed an appendectomy. He has been hospitalized for right lower quadrant abdominal pain within 18 hours. The surgical specimen is edematous and erythematous. Infiltration by what of the following cells is the most typical for the process occurring here?
 - A. Neutrophils
 - B. Eosinophils
 - C. Basophils
 - D. Lymphocytes
 - E. Monocytes
5. Necrosis focus was observed in the area of hyperemia and skin edema in a few hours after burn. What mechanism strengthens destructive effects in the inflammation area?
 - A. Secondary alteration
 - B. Primary alteration
 - C. Emigration of lymphocytes
 - D. Diapedesis of erythrocytes
 - E. Proliferation of fibroblasts
6. A patient who suffers from pneumonia has high body temperature. What biologically active substance plays the leading part in origin of this phenomenon?
 - A. Interleukin-1
 - B. Histamine
 - C. Bradykinin
 - D. Serotonin
 - E. Leukotrienes

7. Inflammation of a patient's eye was accompanied by accumulation of turbid liquid with high protein at the bottom of anterior chamber that was called hypopyon. What process underlies the changes under observation?
- Disturbance of microcirculation
 - Primary alteration
 - Secondary alteration
 - Proliferation
 -
9. Utilization of arachidonic acid via cyclooxygenase pathway results in formation of some bioactive substances. Name them:
- Prostaglandins
 - Thyroxine
 - Biogenic amines
 - Somatomedins
 - Insulin-like growth factors
10. While playing volleyball a sportsman made a jump and landed on the outside edge of his foot. He felt acute pain in the talocrural joint, active movements are limited, passive movements are unlimited but painful. A bit later there appeared a swelling in the area of external ankle, the skin became red and warm. What type of peripheral circulation disturbance is the case?
- Arterial hyperemia
 - Stasis
 - Embolism
 - Venous hyperemia
 - Thrombosis
11. A 17 year old boy fell seriously ill, the body temperature rose up to 38,5 C, there appeared cough, rhinitis, lacrimation, nasal discharges. What inflammation is it?
- Catarrhal
 - Serous
 - Fibrinous
 - Purulent
 - Hemorrhagic
12. A 45 year old woman is ill with breast cancer. Her left arm has symptoms of lymphatic system insufficiency – limb edema, lymph node enlargement. What form of lymphatic circulation insufficiency is it?
- Mechanic insufficiency
 - Dynamic insufficiency
 - Resorption insufficiency
 - Combined insufficiency
 -
13. While playing volleyball a sportsman jumped and then landed across the external edge of his foot. This caused acute pain in the talocrural articulation, active movements became limited, passive movements remained unlimited but painful. In the region of the external ankle a swelling appeared, the skin turned red and became warmer to the touch. What type of peripheral circulation disorder has developed in this case?
- Arterial hyperaemia
 - Stasis

- C. Embolism
- D. Venous hyperaemia
- E. Thrombosis

14. Autopsy of a 73-year-old man who had been suffering from the coronary heart disease along with cardiac insufficiency for a long time revealed: nutmeg liver, brown induration of lungs, cyanotic induration of kidneys and spleen. What kind of circulation disorder was the cause of such effects?

- A. General chronic venous congestion
- B. Arterial hyperaemia
- C. General acute venous congestion
- D. Acute anaemia
- E. Chronic anaemia

15. After transfusion of 200 ml of blood a patient presented with body temperature rise up to 37,9 C. Which of the following substances is the most likely cause of temperature rise?

- A. Interleukin-1
- B. Interleukin-2
- C. Tumour necrosis factor
- D. Interleukin-3
- E. Interleukin-4

16. A patient who has been abusing tobacco smoking for a long time has got cough accompanied by excretion of viscous mucus; weakness after minor physical stress, pale skin. The patient has also lost 12,0 kg of body weight. Endoscopic examination of biopsy material his illness was diagnosed as squamous cell carcinoma. Name a pathological process that preceded formation of the tumour:

- A. Metaplasia
- B. Hypoplasia
- C. Hyperplasia
- D. Necrosis
- E. Sclerosis

17. A 17 year old boy fell seriously ill, the body temperature rose up to 38,5 C, there appeared cough, rhinitis, lacrimation, nasal discharges. What inflammation is it?

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

18. Inflammatory processes cause synthesis of protein of acute phase in an organism. What substances stimulate their synthesis?

- A. Interleukin-1
- B. Immunoglobulins
- C. Interferons
- D. Biogenic amines
- E. Angiotensin

19. A 4 year old child complained of pain during deglutition, indisposition. Objectively: palatine arches and tonsils are moderately edematous and hyperemic, there are greyish-white films up to 1 mm thick closely adhering to the subjacent tissues. What pathological process are these changes typical for?

- A. Inflammation
- B. Dystrophy
- C. Necrosis
- D. Metaplasia
- E. Organization

20. Introduction of a big dose of histamine to an experimental animal caused abrupt drop of arterial pressure as a result of:

- A. Dilatation of resistance vessels
- B. Constriction of resistance vessels
- C. Increase of heart rate
- D. Decrease of heart rate
- E. Decrease of heart rate and force

21. A 25 year old man has spent a long time in the sun under high air humidity. As a result of it his body temperature rose up to 39°C. What pathological process is it?

- A. Hyperthermia
- B. Infectious fever
- C. Hypothermia
- D. Noninfectious fever
- E. Burn disease

22. After transfusion of 200 ml of blood a patient presented with body temperature rise up to 37,9°C. Which of the following substances is the most likely cause of temperature rise?

- A. Interleukin-1
- B. Interleukin-2
- C. Tumour necrosis factor
- D. Interleukin-3
- E. Interleukin-4

23. A student failed to answer all the questions of examination paper correctly. As a result he blushed, felt hot and lost confidence. What type of arterial hyperemia has developed in this case?

- A. Neurotonic hyperemia
- B. Neuroparalytic hyperemia
- C. Metabolic hyperemia
- D. Pathologic hyperemia
- E. Postishemic hyperemia

24. A 41-year-old woman has breast cancer. Her left arm has symptoms of lymphatic system insufficiency – limb edema, lymph node enlargement. What form of lymphatic circulation insufficiency is it?

- A. Mechanic insufficiency
- B. Dynamic insufficiency
- C. Resorption insufficiency
- D. Combined insufficiency
- E. –

25. A 23-year-old man has spent a long time in the sun under high air humidity. As a result of it his body temperature rose up to 39°C. What pathological process is it?

- A. Hyperthermia
- B. Infectious fever
- C. Hypothermia

- D. Noninfectious fever
- E. Burn disease

26. A patient complains about dyspnea provoked by the physical activity. Clinical examination revealed anaemia and presence of the paraprotein in the zone of gamma-globulins. To confirm the myeloma diagnosis it is necessary to determine the following index in the patient's urine:

- A. Bence Jones protein
- B. Bilirubin
- C. Haemoglobin
- D. Ceruloplasmin
- E. Antitrypsin

27. A 56 year old patient suffering from cardiac insufficiency has edema of feet and shins, edematous skin is pale and cold. What is the leading mechanism of edema pathogenesis?

- A. Rise of hydrostatic pressure in venules
- B. Drop of oncotic pressure in capillaries
- C. Increase of capillary permeability
- D. Disorder of lymph outflow
- E. Positive water balance

28. A female patient has been diagnosed with cervical erosion, which is a precancerous pathology. What defense mechanism can prevent the development of a tumor?

- A. Increase in natural killer level (NK cells)
- B. High-dose immunological tolerance
- C. Increase in the activity of lysosomal enzymes
- D. Simplification of the antigenic structure of tissues
- E. Low-dose immunological tolerance

29. A patient with lobar pneumonia has had body temperature of 39°C with daily temperature fluctuation of no more than 1°C for 9 days. This fever can be characterized by the following temperature curve:

- A. Persistent
- B. Hectic
- C. Remittent
- D. Hyperpyretic
- E. Recurrent

30. During the intravenous transfusion of the saline the patient's condition deteriorated dramatically, and the patient died from asphyxiation. Autopsy revealed acute venous congestion of internal organs with the dramatic right heart dilatation. When the right ventricle was punctured underwater, the bubbles escaped. What pathological process occurred in the patient?

- A. Air embolism
- B. Gaseous embolism
- C. Adipose embolism
- D. Tissue embolism
- E. Thromboembolism

31. Deficiency of linoleic and linolenic acids in the body leads to the skin damage, hair loss, delayed wound healing, thrombocytopenia, low resistance to infections. These changes are most likely to be caused by the impaired synthesis of the following substances:

- A. Eicosanoids
- B. Interleukins

- C. Interferons
- D. Catecholamines
- E. Corticosteroids

32. As a result of careless handling of an iron, a 34-year-old female patient has got acute pain, redness, swelling of her right index finger. A few minutes later, there appeared a blister filled with a transparent liquid of straw-yellow color. The described changes are a manifestation of the following pathological process:

- A. Exudative inflammation
- B. Traumatic edema
- C. Alternative inflammation
- D. Proliferative inflammation
- E. Vacuolar degeneration

33. In a patient elevation of body temperature takes turns with drops down to normal levels during the day. The rise in temperature is observed periodically once in four days. Specify the type of temperature curve:

- A. Febris intermittens
- B. Febris continua
- C. Febris recurrens
- D. Febris hectica
- E. Febris remitens

34. A patient has acute bronchitis. The fever up to 38,5°C had lasted for a week, presently there is a decrease in temperature down to 37,0°C. Specify the leading mechanism in the 3rd stage of fever:

- A. Peripheral vasodilation
- B. Increased heat production
- C. Development of chill
- D. Increased diuresis
- E. Increased respiratory rate

35. A 25-year-old patient complains of increasing pain in his leg muscles occurring during walking and forcing him to make frequent stops. Objectively: skin of legs is pale, no hair-covering, toenails are with trophic changes, no pulsation of pedal arteries. The most probable cause of these changes is:

- A. Ischemia
- B. Venous hyperemia
- C. Arterial hyperemia
- D. –
- E. Embolism

36. This year influenza epidemic is characterised by patients' body temperature varying from 36,9°C to 37,9°C. Such fever is called:

- A. Subfebrile
- B. High
- C. Hyperpyretic
- D. Apyretic
- E. Moderate

37. A patient, having suffered a thermal burn, developed painful boils filled with turbid liquid in the skin. What morphological type of inflammation has developed in the patient?

- A. Serous

- B. Proliferative
- C. Croupous
- D. Granulomatous
- E. Diphtheritic

38. A 7-year-old child has acute onset of disease: temperature rise up to 38°C, rhinitis, cough, lacrimation, and large-spot rash on the skin. Pharyngeal mucosa is edematous, hyperemic, with whitish spots in the buccal area. What kind of inflammation caused the changes in the buccal mucosa?

- A. Catarrhal inflammation
- B. Suppurative inflammation
- C. Fibrinous inflammation
- D. Hemorrhagic inflammation
- E. Serous inflammation

39. Cellular composition of exudate largely depends on the etiological factor of inflammation. What leukocytes are the first to be involved in the focus of inflammation caused by pyogenic bacteria?

- A. Neutrophil granulocytes
- B. Monocytes
- C. Myelocytes
- D. Eosinophilic granulocytes
- E. Basophils

40. This year influenza epidemic is characterized by patients' body temperature varying from 36,9°C to 37,9°C. Such fever is called:

- A. Subfebrile
- B. High
- C. Hyperpyretic
- D. Apyretic
- E. Moderate

41. 30 minutes after drinking mango juice a child suddenly developed a local swelling in the area of the soft palate, which impeded swallowing and, eventually, respiration. Mucosa of the swollen area was hyperemic and painless. Blood test revealed moderate eosinophilia. Body temperature was normal. Anamnesis states that the elder sister of the child has been suffering from bronchial asthma attacks. What kind of edema has developed in the child?

- A. Allergic
- B. Inflammatory
- C. Cardiac
- D. Alimentary
- E. Hepatic

Module 3

- Galactosemia has been revealed in a child. Concentration of glucose in the blood has not considerably changed. What enzyme deficiency caused this illness?
 - Galactose-1-phosphate uridylyltransferase
 - Amylo-1,6-glucosidase
 - Phosphoglucomutase
 - Galactokinase
 - Hexokinase
- The patient with diabetes mellitus has been delivered in hospital in the state of unconsciousness. Arterial pressure is low. The patient has acidosis. Point substances, which accumulation in the blood results in these manifestations:
 - Ketone bodies
 - Amino acids
 - Monosaccharides
 - High fatty acids
 - Cholesterol esters
- Some diseases reveal symptoms of aldosteronism with hypertension and edema due to sodium retention in the organism. What organ of the internal secretion is affected on aldosteronism?
 - Adrenal glands
 - Testicle
 - Ovaries
 - Pancreas
 - Hypophysis
- Inflamation is characterised by increasing penetration of vessels of microcirculation stream, increasing of their fluid dynamic blood pressure. Increasing of the osmotic concentration and dispersity of protein structures can be found in the intercellular fluid. What kind of edema are to be observed in this case?
 - Mixed
 - Hydrodynamic
 - Colloid-osmotic
 - Lymphogenic
 - Membranogenic
- The B cells of endocrine portion of pancreas are selectively damaged by alloxan poisoning. How will it be reflected in blood plasma?
 - The content of sugar increases
 - The content of fibrinogen decrease
 - The level of sugar decreases
 - The content of globulins decreases
 - The content of albumins decreases
- The concentration of albumins in human blood sample is lower than normal. This leads to edema of tissues. What blood function is damaged?
 - Maintaining the oncotic blood pressure
 - Maintaining the Ph level
 - Maintaining the body temperature
 - Maintaining the blood sedimentation system

E. All answers are correct

7. Chronic glomerulonephritis was diagnosed in a 34-year-old patient 3 years ago. Edema has developed within the last 6 months. What caused the edema?

- A. Proteinuria
- B. Hyperproduction of vasopressin
- C. Liver dysfunction of protein formation
- D. Hyperosmolarity of plasma
- E. Hyperaldosteronism

8. Patient with diabetes mellitus experienced loss of consciousness and convulsions after an injection of insulin. What might be the result of biochemical blood analysis for concentration of sugar?

- A. 1,5 mmol/L
- B. 8,0 mmol/L
- C. 10,0 mmol/L
- D. 3,3 mmol/L
- E. 5,5 mmol/L

9. A patient is ill with diabetes mellitus that is accompanied by hyperglycemia of over 7,2 millimole/l on an empty stomach. The level of what blood plasma protein allows to estimate the glycemia rate retrospectively (4-8 weeks before examination)?

- A. Glycated hemoglobin
- B. Albumin
- C. Fibrinogen
- D. C-reactive protein
- E. Ceruloplasmin

10. A 4 y.o. child with signs of durative proteinic starvation was admitted to the hospital. The signs were as follows: growth inhibition, anemia, edemata, mental deficiency. Choose a cause of edemata development:

- A. Reduced synthesis of albumins
- B. Reduced synthesis of globulins
- C. Reduced synthesis of hemoglobin
- D. Reduced synthesis of lipoproteins
- E. Reduced synthesis of glycoproteins

11. Examination of a patient revealed reduced contents of magnesium ions that are necessary for attachment of ribosomes to the granular endoplasmatic reticulum. It is known that it causes disturbance of protein biosynthesis. What stage of protein biosynthesis will be disturbed?

- A. Translation
- B. Transcription
- C. Replication
- D. Aminoacid activation
- E. Termination

12. As a result of exhausting muscular work a worker has largely reduced buffer capacity of blood. What acidic substance that came to blood caused this phenomenon?

- A. Lactate
- B. Pyruvate
- C. 1,3-bisphosphoglycerate
- D. 3-phosphoglycerate

E. –

13. A patient was delivered to the hospital by an emergency team. Objectively: grave condition, unconscious, adynamy. Cutaneous surfaces are dry, eyes are sunken, face is cyanotic. There is tachycardia and smell of acetone from the mouth. Analysis results: blood glucose - 20,1 micromole/l (standard is 3,3-5,5 micromole/ l), urine glucose - 3,5%(standard is - 0). What is the most probable diagnosis?

- A. Hyperglycemic coma
- B. Hypoglycemic coma
- C. Acute heart failure
- D. Acute alcoholic intoxication
- E. Anaphylactic shock

14. A woman who has been keeping to a clean-rice diet for a long time was diagnosed with polyneuritis (beriberi). What vitamin deficit results in development of this disease?

- A. Thiamine
- B. Ascorbic acid
- C. Pyridoxine
- D. Folic acid
- E. Riboflavin

15. Examination of a man who hadn't been consuming fats but had been getting enough carbohydrates and proteins for a long time revealed dermatitis, poor wound healing, vision impairment. What is the probable cause of metabolic disorder?

- A. Lack of linoleic acid, vitamins A, D, E, K
- B. Lack of palmitic acid
- C. Lack of vitamins PP, H
- D. Low caloric value of diet
- E. Lack of oleic acid

16. A patient who suffers from heart failure has enlarged liver, edemata of lower extremities, ascites. What is the leading mechanism in the development of this edema?

- A. Hydrodynamic
- B. Colloid osmotic
- C. Lymphogenous
- D. Membranogenic
- E. –

17. Examination of a patient revealed hyperkalemia and hyponatremia. Low secretion of which hormone may cause such changes?

- A. Aldosteron
- B. Vasopressin
- C. Cortisol
- D. Parathormone
- E. Natriuretic

18. A newborn child with pylorostenosis has often repeating vomiting accompanied by apathy, weakness, hypertonicity, sometimes convulsions. What disorder form of acid-base balance is it?

- A. Nongaseous alkalosis
- B. Gaseous alkalosis
- C. Gaseous acidosis
- D. Metabolic acidosis

E. Excretory acidosis

19. An infant has apparent diarrhea resulting from improper feeding. One of the main diarrhea effects is plentiful excretion of sodium bicarbonate. What form of acid-base balance disorder is the case?

- A. Metabolic acidosis
- B. Metabolic alkalosis
- C. Respiratory acidosis
- D. Respiratory alkalosis
- E. No disorders of acid-base balance will be observed

20. A 65 year old man suffering from gout complains of kidney pain. Ultrasound examination revealed renal calculi. The most probable cause of calculi formation is the strengthened concentration of the following substance:

- A. Uric acid
- B. Cholesterol
- C. Bilirubin
- D. Urea
- E. Cystine

21. A chemical burn caused esophagus stenosis. Difficulty of ingestion led to the abrupt loss of weight. In blood: $3,0 \cdot 10^{12}/l$, Hb - 106 g/l, crude protein - 57 g/l. What type of starvation is it?

- A. Incomplete
- B. Proteinic
- C. Complete
- D. Water
- E. Absolute

22. A patient with nephrotic syndrome has massive edemata of his face and limbs. What is the leading pathogenetic mechanism of edemata development?

- A. Drop of oncotic blood pressure
- B. Increase of vascular permeability
- C. Rise of hydrodynamic blood pressure
- D. Lymphostasis
- E. Increase of lymph outflow

23. A doctor examined a child and revealed symptoms of rachitis. Development of this disease was caused by deficiency of the following compound:

- A. 1,25 [OH]-dichydroxycholecalciferol
- B. Biotin
- C. Tocopherol
- D. Naphtaquinone
- E. Retinol

24. A 6 year old child was delivered to a hospital. Examination revealed that the child couldn't fix his eyes, didn't keep his eyes on toys, eye ground had the cherry-red spot sign. Laboratory analyses showed that brain, liver and spleen had high rate of ganglioside glycometide. What congenital disease is the child ill with?

- A. Tay-Sachs disease
- B. Wilson's syndrome
- C. Turner's syndrome
- D. Niemann-Pick disease

E. MacArdle disease

25. A patient ill with enteritis accompanied by massive diarrhea has low water rate in the extracellular space, high water rate inside the cells and low blood osmolarity. What is such disturbance of water-electrolytic metabolism called?

- A. Hypo-osmolar hypohydration
- B. Hyperosmolar hypohydration
- C. Osmolar hypohydration
- D. Hypo-osmolar hyperhydration
- E. Hyperosmolar hyperhydration

26. A 70 year old man is ill with vascular atherosclerosis of lower extremities and coronary heart disease. Examination revealed disturbance of lipidic blood composition. The main factor of atherosclerosis pathogenesis is the excess of the following lipoproteins:

- A. Low-density lipoproteins
- B. Cholesterol
- C. High-density lipoproteins
- D. Intermediate density lipoproteins
- E. Chylomicrons

27. A patient has pellagra. Interrogation revealed that he had lived mostly on maize for a long time and eaten little meat. This disease had been caused by the deficit of the following substance in the maize:

- A. Tryptophan
- B. Tyrosine
- C. Proline
- D. Alanine
- E. Histidine

28. Nappies of a newborn have dark spots being the evidence of homogentisic acid formation. This is caused by the metabolic disorder of the following substance:

- A. Tyrosine
- B. Galactose
- C. Methionine
- D. Cholesterol
- E. Tryptophan

29. A 50-year-old patient complains about general weakness, appetite loss and cardiac arrhythmia. The patient presents with muscle hypotonia, flaccid paralyses, weakened peristaltic activity of the bowels. Such condition might be caused by:

- A. Hypokaliemia
- B. Hypoproteinemia
- C. Hyperkaliemia
- D. Hypophosphatemia
- E. Hyponatremia

30. A 1,5-year-old child presents with both mental and physical lag, decolorizing of skin and hair, decrease in catecholamine concentration in blood. When a few drops of 5% solution of trichloroacetic iron had been added to the child's urine it turned olive green. Such alteration are typical for the following pathology of the amino acid metabolism:

- A. Phenylketonuria
- B. Alkaptonuria

- C. Tyrosinosis
- D. Albinism
- E. Xanthinuria

31. A 12-year-old teenager has significantly put off weight within 3 months; glucose concentration rose up to 50 millimole/l. He fell into a coma. What is the main mechanism of its development?

- A. Hyperosmolar
- B. Hypoglycemic
- C. Ketonemic
- D. Lactacidemic
- E. Hypoxic

32. While determining power inputs of a patient's organism it was established that the respiratory coefficient equaled 1,0. This means that in the cells of the patient the following substances are mainly oxidized:

- A. Carbohydrates
- B. Proteins
- C. Fats
- D. Proteins and carbohydrates
- E. Carbohydrates and fats

33. After taking poor-quality food a patient developed repeated episodes of diarrhea. On the next day he presented with decreased arterial pressure, tachycardia, extrasystole. Blood pH is 7,18. These abnormalities were caused by the development of:

- A. Nongaseous acidosis
- B. Gaseous acidosis
- C. Nongaseous alkalosis
- D. Gaseous alkalosis
- E. Metabolic alkalosis

34. Characteristic sign of glycogenosis is muscle pain during physical work. Blood examination reveals usually hypoglycemia. This pathology is caused by congenital deficiency of the following enzyme:

- A. Glycogen phosphorylase
- B. Glucose 6-phosphate dehydrogenase
- C. Alpha amylase
- D. Gamma amylase
- E. Lysosomal glycosidase

35. Blood of a 12 year old boy presents low concentration of uric acid and accumulation of xanthine and hypoxanthine. This child has genetic defect of the following enzyme:

- A. Xanthine oxidase
- B. Arginase
- C. Urease
- D. Ornithine carbamoyltransferase
- E. Glycerylkinase

36. A full-term newborn child has yellowish skin and mucous membranes. This might be probably caused by temporary deficiency of the following enzyme:

- A. UDPglucuronyltransferase
- B. Uridine transferase
- C. Heme synthetase

- D. Heme oxygenase
- E. Biliverdin reductase

37. Examination of a patient revealed typical presentations of collagenosis. This pathology is characterized by increase of the following urine index:

- A. Hydroxyproline
- B. Arginine
- C. Glucose
- D. Mineral salts
- E. Ammonium salts

38. Examination of a patient suffering from frequent haemorrhages in the inner organs and mucous membranes revealed proline and lysine being included in collagen fibers. Impairment of their hydroxylation is caused by lack of the following vitamin:

- A. C
- B. E
- C. K
- D. A
- E. D

39. A 56 year old patient suffering from cardiac insufficiency has edema of feet and shins, edematous skin is pale and cold. What is the leading mechanism of edema pathogenesis?

- A. Rise of hydrostatic pressure in venules
- B. Drop of oncotic pressure in capillaries
- C. Increase of capillary permeability
- D. Disorder of lymph outflow
- E. Positive water balance

40. A patient was stung by a bee. Examination revealed that his left hand was hot, pink, edematous, there was a big red blister on the site of sting. What is the leading mechanism of edema development?

- A. Increased vessel permeability
- B. Reduced vessel filling
- C. Injury of vessels caused by the sting
- D. Drop of oncotic pressure in tissue
- E. Drop of osmotic pressure in tissue

41. A 50 year old patient has been taking treatment thrice for the last 6 months because of fractures caused by domestic accidents. Microscopical examination of bony tissue revealed foci of lacunar resorption, giant-cell granulomas in the tumour-like formations, cysts. Bony tissue was substituted by fibrous connective tissue. Examination revealed also adenoma of parathyroid gland and hypercalcemia. What is the most probable diagnosis?

- A. Parathyroid osteodystrophy
- B. Myelomatosis
- C. Osteomyelitis
- D. Osteopetrosis
- E. Paget's disease

42. Patients who suffer from severe diabetes and don't receive insulin have metabolic acidosis. This is caused by increased concentration of the following metabolites:

- A. Ketone bodies
- B. Fatty acids

- C. Unsaturated fatty acids
- D. Triacylglycerols
- E. Cholesterol

43. A patient was admitted to the infectious department. His symptoms: dry skin, decreased skin turgor, rice-water stool. The patient was diagnosed with cholera. What disorder of water-electrolytic balance is most often observed in this disease?

- A. Isoosmotic hypohydration
- B. Hyperosmotic hyperhydration
- C. Hypoosmotic hypohydration
- D. Hyperosmotic hypohydration
- E. Hypoosmotic hyperhydration

44. A 2-year-old child with mental and physical retardation has been delivered to a hospital. He presents with frequent vomiting after having meals. There is phenylpyruvic acid in urine. Which metabolism abnormality is the reason for this pathology?

- A. Amino-acid metabolism
- B. Lipidic metabolism
- C. Carbohydrate metabolism
- D. Water-salt metabolism
- E. Phosphoric calcium metabolism

45. Urine analysis of a 12-year-old boy reveals high concentration of all aliphatic amino acids with the highest excretion of cystine and cysteine. US of kidneys revealed kidney concrements. What is the most likely pathology?

- A. Cystinuria
- B. Alkaptonuria
- C. Cystitis
- D. Phenylketonuria
- E. Hartnup disease

46. A patient has an increased pyruvate concentration in blood, most of it is excreted with the urine. What kind of avitaminosis has this patient?

- A. B1
- B. E
- C. B3
- D. B6
- E. B2

47. One of the parents is suspected of having phenylketonuria recessive gene. What is the risk of giving birth to a child with inborn phenylketonuria?

- A. 0%
- B. 25%
- C. 50%
- D. 75%
- E. 100%

48. A 14-year-old teenager has significantly put off weight within 3 months; glucose concentration rose up to 50 millimole/l. He fell into a coma. What is the main mechanism of its development?

- A. Hyperosmolar
- B. Hypoglycemic
- C. Ketonemic

- D. Lactacidemic
- E. Hypoxic

49. A newborn child with pylorostenosis has often repeating vomiting accompanied by apathy, weakness, hypertonicity, sometimes convulsions. What disorder form of acid-base balance is it?

- A. Nongaseous alkalosis
- B. Gaseous alkalosis
- C. Gaseous acidosis
- D. Metabolic acidosis
- E. Excretory acidosis

50. A patient has been diagnosed with alkaptonuria. Choose an enzyme whose deficiency can be the reason for this pathology:

- A. Homogentisic acid oxidase
- B. Phenylalanine hydroxylase
- C. Glutamate dehydrogenase
- D. Pyruvate dehydrogenase
- E. Dioxyphenylalanine decarboxylase

51. An infant has pylorospasm, weakness, hypodynamia, convulsions as a result of frequent vomiting. What kind of acid-base disbalance is it?

- A. Excretory alkalosis
- B. Excretory acidosis
- C. Metabolic acidosis
- D. Exogenous nongaseous acidosis
- E. Gaseous alkalosis

52. A patient with enteritis accompanied by massive diarrhea has low water rate in the extracellular space, high water rate inside the cells and low blood osmolarity. What is such disturbance of water electrolytic metabolism called?

- A. Hypo-osmolar hypohydration
- B. Hyperosmolar hypohydration
- C. Osmolar hypohydration
- D. Hypo-osmolar hyperhydration
- E. Hyperosmolar hyperhydration

53. A newborn child was found to have reduced intensity of sucking, frequent vomiting, hypotonia. Urine and blood exhibit increased concentration of citrulline. What metabolic process is disturbed?

- A. Ornithinic cycle
- B. Tricarboxylic acid cycle
- C. Glycolysis
- D. Glyconeogenesis
- E. Cori cycle

54. Characteristic sign of glycogenosis is muscle pain during physical work. Blood examination reveals usually hypoglycemia. This pathology is caused by congenital deficiency of the following enzyme:

- A. Glycogen phosphorylase
- B. Glucose 6-phosphate dehydrogenase
- C. Alpha amylase
- D. Gamma amylase
- E. Lysosomal glycosidase

55. A month after surgical constriction of rabbit's renal artery the considerable increase of systematic arterial pressure was observed. What of the following regulation mechanisms caused the animal's pressure change?
- A. Angiotensin-II
 - B. Vasopressin
 - C. Adrenaline
 - D. Noradrenaline
 - E. Serotonin
56. A 1,5-year old child with mental and physical retardation has been delivered to a hospital. He presents with frequent vomiting after having meals. There is phenylpyruvic acid in urine. Which metabolism abnormality is the reason for this pathology?
- A. Amino-acid metabolism
 - B. Lipidic metabolism
 - C. Carbohydrate metabolism
 - D. Water-salt metabolism
 - E. Phosphoric calcium metabolism
57. A nurse accidentally injected a nearly double dose of insulin to a patient with diabetes mellitus. The patient lapsed into a hypoglycemic coma. What drug should be injected in order to help him out of coma?
- A. Glucose
 - B. Lipase
 - C. Insulin
 - D. Somatotropin
 - E. Noradrenaline
58. A patient has been diagnosed with alkaptonuria. Choose an enzyme whose deficiency can be the reason for this pathology:
- A. Homogentisic acid oxidase
 - B. Phenylalanine hydroxylase
 - C. Glutamate dehydrogenase
 - D. Pyruvate dehydrogenase
 - E. Dioxypyphenylalanine decarboxylase
59. An infant has pylorospasm, weakness, hypodynamia, convulsions as a result of frequent vomiting. What kind of acid-base disbalance is it?
- A. Excretory alkalosis
 - B. Excretory acidosis
 - C. Metabolic acidosis
 - D. Exogenous nongaseous acidosis
 - E. Gaseous alkalosis
60. A 49 year old woman spent a lot of time standing. As a result of it she got leg edema. What is the most likely cause of the edema?
- A. Increase in hydrostatic pressure of blood in veins
 - B. Decrease in hydrostatic pressure of blood in veins
 - C. Decrease in hydrostatic pressure of blood in arteries
 - D. Increase in oncotic pressure of blood plasma
 - E. Increase in systemic arterial pressure

61. A 64 year old woman has impairment of twilight vision (hemeralopy). What vitamin should be recommended in the first place?
- A. A
 - B. B2
 - C. E
 - D. C
 - E. B6
62. A 4 year old child with hereditary renal lesion has signs of rickets, vitamin D concentration in blood is normal. What is the most probable cause of rickets development?
- A. Impaired synthesis of calcitriol
 - B. Increased excretion of calcium
 - C. Hyperfunction of parathyroid glands
 - D. Hypofunction of parathyroid glands
 - E. Lack of calcium in food
63. After taking poor-quality food a patient developed repeated episodes of diarrhea. On the next day he presented with decreased arterial pressure, tachycardia, extrasystole. Blood pH is 7,18. These abnormalities were caused by the development of:
- A. Nongaseous acidosis
 - B. Gaseous acidosis
 - C. Nongaseous alkalosis
 - D. Gaseous alkalosis
 - E. Metabolic alkalosis
64. A patient with diabetes developed a diabetic coma due to the acid-base imbalance. Specify the kind of this imbalance:
- A. Metabolic acidosis
 - B. Metabolic alkalosis
 - C. Respiratory acidosis
 - D. Gaseous alkalosis
 - E. Non-gaseous alkalosis
65. A patient with respiratory failure has blood pH of 7,35. pCO₂ test revealed hypercapnia. Urine pH test revealed an increase in the urine acidity. What form of acid-base imbalance is the case?
- A. Compensated respiratory acidosis
 - B. Compensated metabolic acidosis
 - C. Decompensated metabolic acidosis
 - D. Compensated respiratory alkalosis
 - E. Decompensated respiratory alkalosis
66. A comatose patient was taken to the hospital. He has a history of diabetes mellitus. Objectively: Kussmaul breathing, low blood pressure, acetone odor of breath. After the emergency treatment the patient's condition improved. What drug had been administered to the patient?
- A. Insulin
 - B. Adrenaline
 - C. Isadrinum
 - D. Glibenclamide
 - E. Furosemide
67. A patient with a pathology of the cardiovascular system developed edemata of the lower extremities. What is the mechanism of cardiac edema development?

- A. Increased hydrostatic pressure at the venous end of the capillary
- B. Increased oncotic pressure
- C. Increased hydrostatic pressure at the arterial end of the capillary
- D. Reduced osmotic pressure
- E. Lymph efflux disorder

68. One of the factors that cause obesity is the inhibition of fatty acids oxidation due to:

- A. Low level of carnitine
- B. Impaired phospholipid synthesis
- C. Excessive consumption of fatty foods
- D. Choline deficiency
- E. Lack of carbohydrates in the diet

69. A 67-year-old male patient consumes eggs, pork fat, butter, milk and meat. Blood test results: cholesterol - 12,3 mmol/l, total lipids - 8,2 g/l, increased low density lipoprotein fraction (LDL). What type of hyperlipoproteinemia is observed in the patient?

- A. Hyperlipoproteinemia type IIa
- B. Hyperlipoproteinemia type I
- C. Hyperlipoproteinemia type IIb
- D. Hyperlipoproteinemia type IV
- E. Cholesterol, hyperlipoproteinemia

70. A hypertensive patient had been keeping to a salt-free diet and taking antihypertensive drugs together with hydrochlorothiazide for a long time. This resulted in electrolyte imbalance. What disorder of the internal environment occurred in the patient?

- A. Hypochloremic alkalosis
- B. Metabolic acidosis
- C. Hyperkalemia
- D. Hypermagnesemia
- E. Increase in circulating blood volume

71. A patient with constant headaches, pain in the occipital region, tinnitus, dizziness has been admitted to the cardiology department. Objectively: AP - 180/110 mm Hg, heart rate - 95/min. Radiographically, there is a stenosis of one of the renal arteries. Hypertensive condition in this patient has been caused by the activation of the following system:

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

72. A female patient complains of vision impairment. On examination she was found to have obesity, fasting hyperglycemia. What complication of diabetes can cause vision impairment?

- A. Microangiopathy
- B. Macroangiopathy
- C. Atherosclerosis
- D. Neuropathy
- E. Glomerulopathy

73. 12-year-old patient was found to have blood serum cholesterol at the rate of 25 mmol/l. The boy has a history of hereditary familial hypercholesterolemia, which is caused by the impaired synthesis of the following protein receptors:

- A. Low density lipoproteins
- B. High density lipoproteins
- C. Chylomicrons
- D. Very low density lipoproteins
- E. Intermediate density lipoproteins

74. In a young man during exercise, the minute oxygen uptake and carbon dioxide emission equalled to 1000 ml. What substrates are oxidized in the cells of his body?

- A. Carbohydrates
- B. Proteins
- C. Fats
- D. Carbohydrates and fats
- E. Carbohydrates and proteins

75. Increased HDL levels decrease the risk of atherosclerosis. What is the mechanism of HDL anti-atherogenic action?

- A. They remove cholesterol from tissues
- B. They supply tissues with cholesterol
- C. They are involved in the breakdown of cholesterol
- D. They activate the conversion of cholesterol to bile acids
- E. They promote absorption of cholesterol in the intestine

76. A 46-year-old female patient consulted a doctor about pain in the small joints of the upper and lower limbs. The joints are enlarged and shaped like thickened nodes. Serum test revealed an increase in urate concentration. This might be caused by a disorder in metabolism of:

- A. Purines
- B. Carbohydrates
- C. Lipids
- D. Pyrimidines
- E. Amino acids

77. Diabetic nephropathy with uremia has developed in a patient with pancreatic diabetes. The velocity of glomerular filtration is 9 ml/min. What mechanism of a decrease in glomerular filtration velocity and chronic renal failure development is most likely in the case of this patient?

- A. Reduction of active nephron mass
- B. Decrease in systemic arterial pressure
- C. Obstruction of nephron tubules with hyaline casts
- D. Tissue acidosis
- E. Arteriolar spasm

78. Prolonged fasting causes hypoglycemia which is amplified by alcohol consumption, as the following process is inhibited:

- A. Gluconeogenesis
- B. Glycolysis
- C. Glycogenolysis
- D. Lipolysis
- E. Proteolysis

79. A 39-year-old female patient with a history of diabetes was hospitalized in a precomatose state for diabetic ketoacidosis. This condition had been caused by an increase in the following metabolite level:

- A. Acetoacetate

- B. Citrate
- C. Alpha-ketoglutarate
- D. Malonate
- E. Aspartate

80. A patient with homogentisuria has signs of arthritis, ochronosis. In this case, the pain in the joints is associated with the deposition of:

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

81. In case of alkaptonuria, homogentisic acid is excreted in urine in large amounts. The development of this disease is associated with a disorder of metabolism of the following amino acid:

- A. Tyrosine
- B. Phenylalanine
- C. Alanine
- D. Methionine
- E. Asparagine

82. Examination of a 56-year-old female patient with a history of type 1 diabetes revealed a disorder of protein metabolism that is manifested by aminoacidemia in the laboratory blood test values, and clinically by the delayed wound healing and decreased synthesis of antibodies. Which of the following mechanisms causes the development of aminoacidemia?

- A. Increased proteolysis
- B. Albuminosis
- C. Decrease in the concentration of amino acids in blood
- D. Increase in the oncotic pressure in the blood plasma
- E. Increase in low-density lipoprotein level

83. A 67-year-old male patient consumes eggs, pork fat, butter, milk and meat. Blood test results: cholesterol - 12,3 mmol/l, total lipids - 8,2 g/l, increased low-density lipoprotein fraction (LDL). What type of hyperlipoproteinemia is observed in the patient?

- A. Hyperlipoproteinemia type IIa
- B. Hyperlipoproteinemia type I
- C. Hyperlipoproteinemia type IIb
- D. Hyperlipoproteinemia type IV
- E. Cholesterol, hyperlipoproteinemia

84. A patient has severe blood loss caused by an injury. What kind of dehydration will be observed in this particular case?

- A. Iso-osmolar
- B. Hyposmolar
- C. Hyperosmolar
- D. Normosmolar
- E. —

85. A patient has the oxyhemoglobin dissociation curve shifted to the left. What blood changes induce this condition?

- A. Alkalosis, hypocapnia, temperature drop

- B. Acidosis, hypercapnia, temperature rise
- C. Acidosis, hypercapnia, temperature drop
- D. Acidosis, hypocapnia, temperature rise
- E. –

86. A patient has been diagnosed with alkaptonuria. Choose an enzyme that can cause this pathology when deficient:

- A. Homogentisic acid oxidase
- B. Phenylalanine hydroxylase
- C. Glutamate dehydrogenase
- D. Pyruvate dehydrogenase
- E. Dioxyphenylalanine decarboxylase

87. An infant has pylorospasm, weakness, hypodynamia, convulsions as a result of frequent vomiting. What kind of acid-base disbalance is it?

- A. Excretory alkalosis
- B. Excretory acidosis
- C. Metabolic acidosis
- D. Exogenous nongaseous acidosis
- E. Gaseous alkalosis

88. A 30-year-old man with diabetes mellitus type I was hospitalised. The patient is comatose. Laboratory tests revealed hyperglycemia and ketonemia. What metabolic disorder can be detected in this patient?

- A. Metabolic acidosis
- B. Metabolic alkalosis
- C. Respiratory acidosis
- D. Respiratory alkalosis
- E. Normal acid-base balance

89. A 15-year-old patient has fasting plasma glucose level 4,8 mmol/l, one hour after glucose challenge it becomes 9,0 mmol/l, in 2 hours it is 7,0 mmol/l, in 3 hours it is 4,8 mmol/l. Such parameters are characteristic of:

- A. Subclinical diabetes mellitus
- B. Diabetes mellitus type 1
- C. Diabetes mellitus type 2
- D. Healthy person
- E. Cushing's disease

90. A 6-year-old child suffers from delayed growth, disrupted ossification processes, decalcification of the teeth. What can be the cause?

- A. Vitamin D deficiency
- B. Decreased glucagon production
- C. Insulin deficiency
- D. Hyperthyroidism
- E. Vitamin C deficiency

91. A woman complains of visual impairment. Examination revealed obesity in the patient and her fasting plasma glucose level is hyperglycemic. What diabetes complication can cause visual impairment/blindness?

- A. Microangiopathy
- B. Macroangiopathy

- C. Atherosclerosis
- D. Neuropathy
- E. Glomerulopathy

92. A patient suffers from disrupted patency of the airways at the level of small and medium-sized bronchial tubes. What changes of acid-base balance can occur in the patient?

- A. Respiratory acidosis
- B. Respiratory alkalosis
- C. Metabolic acidosis
- D. Metabolic alkalosis
- E. Acid-base balance remains unchanged

93. Upon toxic damage of hepatic cells resulting in disruption of liver function the patient developed edemas. What changes of blood plasma are the main cause of edema development?

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

94. Atria of an experimental animal were superdistended with blood, which resulted in decreased reabsorption of Na^+ and water in renal tubules. This can be explained by the influence of the following factor on kidneys:

- A. Natriuretic hormone
- B. Aldosterone
- C. Renin
- D. Angiotensin
- E. Vasopressin

95. A patient with insulin-dependent diabetes mellitus has been administered insulin. After a certain period of time the patient developed fatigue, irritability, excessive sweating. What is the main mechanism of such presentations developing?

- A. Carbohydrate starvation of the brain
- B. Increased glycogenolysis
- C. Increased ketogenesis
- D. Increased lipogenesis
- E. Decreased glyconeogenesis

96. Leading symptoms of primary hyperparathyroidism are osteoporosis and renal damage resulting in urolithiasis development. What substances are the basis of uroliths in such cases?

- A. Calcium phosphate
- B. Uric acid
- C. Cysteine
- D. Bilirubin
- E. Cholesterol

97. A man has suffered multiple bone fractures of his lower extremities during a traffic accident. During transportation to a hospital his condition was further aggravated: blood pressure decreased, there were signs of pulmonary artery embolism. What kind of embolism is the most likely in the given case?

- A. Fat embolism
- B. Air embolism

- C. Gas embolism
- D. Tissue embolism
- E. Thromboembolism

98. A 7-year-old child suffers from delayed growth, disrupted ossification processes, decalcification of the teeth. What can be the cause?

- A. Vitamin D deficiency
- B. Decreased glucagon production
- C. Insulin deficiency
- D. Hyperthyroidism
- E. Vitamin C deficiency

99. A man complains of visual impairment. Examination revealed obesity in the patient and her fasting plasma glucose level is hyperglycemic. What diabetes complication can cause visual impairment/blindness?

- A. Microangiopathy
- B. Macroangiopathy
- C. Atherosclerosis
- D. Neuropathy
- E. Glomerulopathy

Module 4

1. A patient with hypochromic anemia has splitting and loss of hair, increased nail brittling and taste alteration. What is the mechanism of the symptoms development?
 - A. Deficiency of iron-containing enzymes
 - B. Deficiency of vitamin ₁₂
 - C. Decreased production of parathyrin
 - D. Deficiency of vitamin A
 - E. Decreased
2. In the blood of a 26-year-old man 18% of erythrocytes of the spherical, ballshaped, flat and thorn-like shape have been revealed. Other eritrocytes were in the form of the concavo-concave disks. How is this phenomenon called?
 - A. Physiological poikilocytosis
 - B. Pathological poikilocytosis
 - C. Physiological anisocytosis
 - D. Pathological anisocytosis
 - E. Erythrocytosis
3. There is an inhibited coagulation in the patients with bile ducts obstruction, bleeding due to the low level of absorbtion of a vitamin. What vitamin is in deficiency?
 - A. K
 - B. A
 - C. D
 - D. E
 - E. Carotene
4. Patient 54 year-old, 5th day after surgical operation. Blood count: Erythrocytes $3,6 \cdot 10^{12}/l$, Hemoglobin 95 g/l, Erythrocyte's hemoglobin content (color index) 0,78; Leukocytes $16 \cdot 10^9/l$, Platelets $450 \cdot 10^9/l$ Blood picture: anizocytosis, poikilocytosis, reticulocytes-3,8%. What anemia does this patient have?
 - A. Acute posthemorrhagic anemia
 - B. Acquired hemolytic anemia
 - C. Anemia from iron deficiency
 - D. Hypoplastic anemia
 - E. Chronic posthemorrhagic anemia
5. A patient's blood was analyzed and the decreased erythrocyte's sedimentation rate (ESR) was discovered. What disease from the listed below is accompanied with decreased ESR?
 - A. Polycytemia
 - B. Hepatitis
 - C. Splenomegaly
 - D. Vitamin B deficiency
 - E. Myocardial infarction
6. Substitution of the glutamic acid on valine was revealed while examining initial molecular structure. For what inherited pathology is this symptom typical?
 - A. Sickle-cell anemia
 - B. Thalassemia
 - C. Minkowsky-Shauffard disease
 - D. Favism

E. Hemoglobinosis

7. Punctate hemorrhage was found out in the patient after application of a tourniquet. With disfunction of what blood cells is it connected?

- A. Platelets
- B. Eosinophiles
- C. Monocytes
- D. Lymphocytes
- E. Neutrophiles

8. A 2-year-old child has got intestinal dysbacteriosis, which results in hemorrhagic syndrome. What is the most likely cause of hemorrhage of the child?

- A. Vitamin K insufficiency
- B. Activation of tissue thromboplastin
- C. PP hypovitaminosis
- D. Fibrinogen deficiency
- E. Hypocalcemia

9. In course of an experiment a big number of stem cells of red bone marrow was in some way destructed. Regeneration of which cell populations in the loose connective tissue will be inhibited?

- A. Of macrophags
- B. Of fibroblasts
- C. Of pigment cells
- D. Of lipocytes
- E. Of pericytes

10. Examination of a 43 y.o. anephric patient revealed anemia symptoms. What is the cause of these symptoms?

- A. Reduced synthesis of erythropoietins
- B. Enhanced destruction of erythrocytes
- C. Iron deficit
- D. Vitamin B12 deficit
- E. Folic acid deficit

11. 24 hours after appendectomy blood of a patient presents neutrophilic leukocytosis with regenerative shift. What is the most probable mechanism of leukocytosis development?

- A. Amplification of leukopoiesis
- B. Redistribution of leukocytes in the organism
- C. Decelerated leukocyte destruction
- D. Deceleratied emigration of leukocytes to the tissues
- E. Amplification of leukopoiesis and decelerated emigration of leukocytes to the tissues

12. A patient was ill with burn disease that was complicated by DIC syndrome. What stage of DIC syndrome can be suspected if it is known that the patient's blood coagulates in less than 3 minutes?

- A. Hypercoagulation
- B. Transition phase
- C. Hypocoagulation
- D. Fibrinolysis
- E. Terminal

13. A 55 y.o. woman consulted a doctor about having continuous cyclic uterine hemorrhages for a year, weakness, dizziness. Examination revealed skin pallor. Hemogram: Hb- 70 g/l, erythrocytes -

3, $2 \cdot 10^{12}/l$, color index - 0,6, leukocytes - $6, 0 \cdot 10^9/l$, reticulocytes - 1%; erythrocyte hypochromia.

What anemia is it?

- A. Chronic posthemorrhagic anemia
- B. Hemolytic anemia
- C. Aplastic anemia
- D. B12-folate-deficiency anemia
- E. Iron-deficiency anemia

14. A 23 y.o. patient complains of weakness, temperature rise up to 38-40 C. Objectively: liver and spleen are enlarged. Hemogram: Hb-100 g/l, erythrocytes - $2, 9 \cdot 10^{12}/l$, leukocytes - $4, 4 \cdot 10^9/l$, thrombocytes - $48 \cdot 10^9/l$, segmentonuclear neutrophils - 17%, lymphocytes - 15%, blast cells - 68%. All cytochemical reactions are negative. Make a hematological conclusion:

- A. Undifferentiated leukosis
- B. Chronic myeloleukosis
- C. Acute myeloblastic leukosis
- D. Acute lymphoblastic leukosis
- E. Acute erythromyelosis

15. A 3 year old child with fever was given aspirin. It resulted in intensified erythrocyte haemolysis. Hemolytic anemia might have been caused by congenital insufficiency of the following enzyme:

- A. Glucose 6-phosphate dehydrogenase
- B. Glucose 6-phosphatase
- C. Glycogen phosphorylase
- D. Glycerol phosphate dehydrogenase
- E. γ -glutamyltransferase

16. A 20 year old patient complains of general weakness, dizziness, quick fatigability. Blood analysis results: Hb-80 g/l. Microscopical examination results: erythrocytes are of modified form. This condition might be caused by:

- A. Sickle-cell anemia
- B. Hepatocellular jaundice
- C. Acute intermittent porphyria
- D. Obturative jaundice
- E. Addison's disease

17. 2 years ago a patient underwent resection of pyloric part of stomach. He complains of weakness, periodical dark shadows beneath his eyes, dyspnea. In blood: Hb - 70 g/l, erythrocytes - $3, 0 \cdot 10^{12}/l$, colour index - 0,7. What changes of erythrocytes in blood smears are the most typical for this condition?

- A. Microcytes
- B. Megalocytes
- C. Schizocytes
- D. Ovalocytes
- E. Macrocytes

18. A 56 year old patient came to a hospital with complaints about general weakness, tongue pain and burning, sensation of limb numbness. In the past he underwent resection of forestomach. In blood: Hb-80 g/l; erythrocytes - $2, 0 \cdot 10^{12}/l$; colour index - 1,2, leukocytes - $3, 5 \cdot 10^9/l$. What anemia type is it?

- A. B12-folate deficient
- B. Hemolytic

- C. Posthemorrhagic
- D. Aplastic
- E. Iron-deficient

19. Two hours after an exam a student had a blood count done and it was revealed that he had leukocytosis without significant leukogram modifications. What is the most probable mechanism of leukocytosis development?

- A. Redistribution of leukocytes in the organism
- B. Leukopoiesis intensification
- C. Deceleration of leukocyte lysis
- D. Deceleration of leukocyte migration to the tissues
- E. Leukopoiesis intensification and deceleration of leukocyte lysis

20. A 16 year old boy after an illness has diminished function of protein synthesis in liver as a result of vitamin K deficiency. It will cause disturbance of:

- A. Blood coagulation
- B. Erythrocyte sedimentation rate
- C. Anticoagulant generation
- D. Erythropoietin secretion
- E. Osmotic blood pressure

21. A patient was diagnosed with autoimmune hemolytic cytotoxic anemia. What substances are antigens in II type allergic reactions?

- A. Modified receptors of cell membranes
- B. Antibiotics
- C. Hormones
- D. Serum proteins
- E. Inflammation modulators

22. A patient underwent a surgery for excision of a cyst on pancreas. After this he developed haemorrhagic syndrome with apparent disorder of blood coagulation. Development of this complication can be explained by:

- A. Activation of fibrinolytic system
- B. Insufficient fibrin production
- C. Reduced number of thrombocytes
- D. Activation of anticoagulation system
- E. Activation of Christmas factor

23. A mother consulted a doctor about her 5-year-old child who develops erythemas, vesicular rash and skin itch under the influence of sun. Laboratory studies revealed decreased iron concentration in the blood serum, increased uroporphyrinogen I excretion with the urine. What is the most likely inherited pathology in this child?

- A. Erythropoietic porphyria
- B. Methemoglobinemia
- C. Hepatic porphyria
- D. Coproporphyrin
- E. Intermittent porphyria

24. A 38-year-old patient with an uterine haemorrhage lasting for 2 days was delivered to the admission ward. Which of the following will be revealed in the patient's blood?

- A. Decrease in the haematocrite index
- B. Eosinophilia

- C. Deceleration in ESR
- D. Leukocytosis
- E. Increase in the colour index

25. A 70-year-old patient suffers from atherosclerosis complicated by the lower limb thrombosis that has caused gangrene on his left toes. What is the most likely cause of the thrombosis origin?

- A. Thrombocyte adhesion
- B. Prothrombinase activation
- C. Transformation of prothrombin into thrombin
- D. Transformation of fibrinogen into fibrin
- E. Impaired heparin synthesis

26. As a result of increased permeability of the erythrocyte membrane in a patient with microspherocytic anaemia (Minkowsky-Shauffard disease) cells receive sodium ions and water. Erythrocytes take form of spherocytes and can be easily broken down. What is the leading mechanism of erythrocyte damage in this case?

- A. Electrolytic osmotic
- B. Calcium
- C. Acidotic
- D. Protein
- E. Nucleic

27. Examination of a patient admitted to the surgical department with symptoms of acute appendicitis revealed the following changes in the white blood cells: the total count of leukocytes is $16 \cdot 10^9/l$. Leukocyte formula: basophils - 0, eosinophils - 2%, juvenile forms - 2%, stabnuclear - 8%, segmentonuclear - 59%, lymphocytes - 25%, monocytes- 4%. The described changes can be classified as:

- A. Neutrophilia with regenerative left shift
- B. Neutrophilia with right shift
- C. Neutrophilia with degenerative left shift
- D. Neutrophilic leukemoid reaction
- E. Neutrophilia with hyperregenerative left shift

28. A patient suffers from the haemorrhagic syndrome that shows itself in frequent nasal bleedings, posttraumatic and spontaneous intracutaneous and intra-articular haemorrhages. After a laboratory study a patient was diagnosed with the type B haemophilia. This disease is provoked by the deficit of the following factor of blood coagulation:

- A. IX
- B. VIII
- C. XI
- D. V
- E. VII

29. A 34 year old woman was diagnosed with hereditary microspherocytic hemolytic anemia (Minkowsky-Shauffard disease). What mechanism caused haemolysis of erythrocytes?

- A. Membranopathy
- B. Enzymopathy
- C. Hemoglobinopathy
- D. Autoimmune disorder
- E. Bone marrow hypoploasia

30. A 25 year old Palestinian woman complains of weakness, dizziness, dyspnea. In anamnesis: periodically exacerbating anemia. In blood: Hb – 60 g/l, erythrocytes - $2,5 \cdot 10^{12}/l$, reticulocytes – 35 %, anisocytosis and poikilocytosis of erythrocytes, a lot of target cells and polychromatophils. What type of anemia is it?
- A. Thalassemia
 - B. Sickle-cell anemia
 - C. Minkowsky-Shauffard disease
 - D. Addison-Biermer disease
 - E. Glucose 6-phosphate dehydrogenasedeficient anemia
31. A 47 year old man with myocardium infarction was admitted to the cardiological department. What changes of cellular composition of peripheral blood are induced by necrotic changes in the myocardium?
- A. Neutrophilic leukocytosis
 - B. Monocytosis
 - C. Eosinophilic leukocytosis
 - D. Thrombocytopenia
 - E. Lymphopenia
32. A 15 year old girl has pale skin, glossitis, gingivitis. Blood count: erythrocytes - $3,3 * 10^{12}/l$, hemoglobin - 70 g/l, colour index - 0,5. Examination of blood smear revealed hypochromia, microcytosis, poikilocytosis. What type of anemia is it?
- A. Iron-deficient
 - B. B12-folic acid-deficient
 - C. Sickle-cell
 - D. Hemolytic
 - E. Thalassemia
33. A disaster fighter at a nuclear power plant developed hemorrhagic syndrome on the background of acute radiation disease. What is the most important factor of syndrome pathogenesis?
- A. Thrombocytopenia
 - B. Vascular wall damage
 - C. Increased activity of fibrinolysis factors
 - D. Increased activity of anticoagulative system factors
 - E. Decreased activity of coagulative factors
34. A tooth extraction in a patient with chronic persistent hepatitis was complicated with prolonged hemorrhage. What is the reason for the haemorrhagic syndrome?
- A. Decrease in thrombin production
 - B. Increase in thromboplastin production
 - C. Decrease in fibrin production
 - D. Increase in fibrinogen synthesis
 - E. Fibrinolysis intensification
35. After a tourniquet application a patient was found to have petechial haemorrhages. The reason for it is the dysfunction of the following cells:
- A. Platelets
 - B. Eosinophils
 - C. Monocytes
 - D. Lymphocytes
 - E. Neutrophils

36. After implantation of a cardiac valve a young man constantly takes indirect anticoagulants. His state was complicated by hemorrhage. What substance content has decreased in blood?
- A. Prothrombin
 - B. Haptoglobin
 - C. Heparin
 - D. Creatin
 - E. Ceruloplasmin
37. A patient suffering from chronic myeloleukemia has got the following symptoms of anemia: decreased number of erythrocytes and low haemoglobin concentration, oxyphilic and polychromatophilic normocytes, microcytes. What is the leading pathogenetic mechanism of anemia development?
- A. Substitution of haemoblast
 - B. Intravascular hemolysis of erythrocytes
 - C. Deficiency of vitamin B12
 - D. Reduced synthesis of erythropoietin
 - E. Chronic haemorrhage
38. A 42 year old patient complains of pain in the epigastral area, vomiting; vomit masses have the colour of "coffee-grounds", the patient has also melena. Anamnesis records gastric ulcer. Blood formula: erythrocytes - $2,8 * 10^{12}/l$, leukocytes – $8 * 10^9/l$, Hb - 90 g/l. What complication is it?
- A. Haemorrhage
 - B. Penetration
 - C. Perforation
 - D. Canceration
 - E. Pyloric stenosis
39. A disaster fighter at a nuclear power plant developed hemorrhagic syndrome on the background of acute radiation disease. What is the most important factor of syndrome pathogenesis?
- A. Thrombocytopenia
 - B. Vascular wall damage
 - C. Increased activity of fibrinolysis factors
 - D. Increased activity of anticoagulative system factors
 - E. Decreased activity of coagulative factors
40. A 26 year old pregnant woman is under treatment at an in-patient hospital. After a continuous attack of vomiting she was found to have reduced volume of circulating blood. What kind of change in general blood volume is the case?
- A. Polycythemic hypovolemia
 - B. Simple hypovolemia
 - C. Oligocythemic hypovolemia
 - D. Polycythemic hypervolemia
 - E. Oligocythemic hypervolemia
41. Hemoglobin catabolism results in release of iron which is transported to the bone marrow by a certain transfer protein and used again for the synthesis of hemoglobin. Specify this transfer protein:
- A. Transferrin (siderophilin)
 - B. Transcobalamin
 - C. Haptoglobin
 - D. Ceruloplasmin
 - E. Albumin

42. A 3-year-old boy with pronounced hemorrhagic syndrome doesn't have antihemophilic globulin A (factor VIII) in the blood plasma. Hemostasis has been impaired at the following stage:
- A. Internal mechanism of prothrombinase activation
 - B. External mechanism of prothrombinase activation
 - C. Conversion of prothrombin to thrombin
 - D. Conversion of fibrinogen to fibrin
 - E. Blood clot retraction
43. On the fifth day after the acute blood loss a patient has been diagnosed with hypochromic anemia. What is the main mechanism of hypochromia development?
- A. Release of immature red blood cells from the bone marrow
 - B. Impaired iron absorption in the intestines
 - C. Increased destruction of red blood cells in the spleen
 - D. Impaired globin synthesis
 - E. Increased excretion of body iron
44. A 12-year-old patient has been admitted to a hospital for hemarthrosis of the knee joint. From early childhood he suffers from frequent bleedings. Diagnose the boy's disease:
- A. Hemophilia
 - B. Hemorrhagic vasculitis
 - C. Hemolytic anemia
 - D. B12 (folic acid)-deficiency anemia
 - E. Thrombocytopenic purpura
45. In a car accident a man got injured and lost a lot of blood. What changes in peripheral blood are most likely to occur on the 2nd day after the injury?
- A. Erythropenia
 - B. Hypochromia
 - C. Anisocytosis
 - D. Microplania
 - E. Significant reticulocytosis
46. After the prolonged vomiting a pregnant 26-year-old woman was found to have the reduced volume of circulating blood. What change in the total blood volume can be the case?
- A. Polycythemic hypovolemia
 - B. Simple hypovolemia
 - C. Oligocythemic hypovolemia
 - D. Polycythemic hypervolemia
 - E. Oligocythemic hypervolemia
47. Examination of a 52-year-old female patient has revealed a decrease in the amount of red blood cells and an increase in free hemoglobin in the blood plasma (hemoglobinemia). Color index is 0,85. What type of anemia is being observed in the patient?
- A. Acquired hemolytic
 - B. Hereditary hemolytic
 - C. Acute hemorrhagic
 - D. Chronic hemorrhagic
 - E. Anemia due to diminished erythropoiesis
48. A patient is diagnosed with hereditary coagulopathy that is characterized by factor VIII deficiency. Specify the phase of blood clotting during which coagulation will be disrupted in the given case:

- A. Thromboplastin formation
- B. Thrombin formation
- C. Fibrin formation
- D. Clot retraction
- E. –

49. A 37-year-old female patient complains of headache, vertigo, troubled sleep, numbness of limbs. For the last 6 years she has been working at the gas-discharge lamp-producing factory in the lead-processing shop. Blood test findings: low hemoglobin and RBC level, serum iron concentration exceeds the norm by several times. Specify the type of anemia:

- A. Iron refractory anemia
- B. Iron-deficiency anemia
- C. Minkowsky-Shauffard disease
- D. Hypoplastic anemia
- E. Metaplastic anemia

50. A patient is diagnosed with iron-deficiency sideroachrestic anemia, progression of which is characterized by skin hyperpigmentation, pigmentary cirrhosis, heart and pancreas affection. Iron level in the blood serum is increased. What disorder of iron metabolism causes this disease?

- A. Failure to assimilate iron leading to iron accumulation in tissues
- B. Excessive iron intake with food
- C. Disorder of iron absorption in bowels
- D. Increased iron assimilation by body
- E. –

51. A blood drop has been put into a test tube with 0,3% solution of NaCl. What will happen to erythrocytes?

- A. Osmotic haemolysis
- B. Shrinkage
- C. Mechanical haemolysis
- D. Any changes will be observed
- E. Biological haemolysis

52. Along with normal hemoglobin types there can be pathological ones in the organism of an adult. Name one of them:

- A. HbS
- B. HbF
- C. HbA₁
- D. HbA₂
- E. HbO₂

53. A patient is diagnosed with hereditary coagulopathy that is characterized by factor VIII deficiency. Specify the phase of blood clotting during which coagulation will be disrupted in the given case:

- A. Thromboplastin formation
- B. Thrombin formation
- C. Fibrin formation
- D. Clot retraction
- E. –

54. A 27-year-old girl complains of headache, vertigo, troubled sleep, numbness of limbs. For the last 6 years she has been working at a gas-discharge lamp-producing factory in a lead-processing

shop. Blood test findings: low hemoglobin and RBC level, serum iron concentration exceeds the norm by several times. Specify the type of anemia:

- A. Iron refractory anemia
- B. Iron-deficiency anemia
- C. Minkowsky-Shauffard disease
- D. Hypoplastic anemia
- E. Metaplastic anemia

55. A patient is diagnosed with chronic atrophic gastritis attended by deficiency of Castle's intrinsic factor. What type of anemia does the patient have?

- A. B₁₂-deficiency anemia
- B. Iron refractory anemia
- C. Hemolytic anemia
- D. Iron-deficiency anemia
- E. Protein-deficiency anemia

56. Biochemical analysis of an infant's erythrocytes revealed evident glutathione peroxidase deficiency and low concentration of reduced glutathione. What pathological condition can develop in this infant?

- A. Hemolytic anemia
- B. Pernicious anemia
- C. Megaloblastic anemia
- D. Sicklemia
- E. Iron-deficiency anemia

57. A 59-year-old woman has been hospitalized in a surgical ward due to exacerbation of chronic osteomyelitis of the left shin. Blood test: leukocytes – $15,0 \cdot 10^9/l$. Leukogram: myelocytes – 0%, metamyelocytes – 8%, stab neutrophils – 28%, segmented neutrophils – 32%, lymphocytes – 29%, monocytes – 3%. Such blood count would be called:

- A. Regenerative left shift
- B. Right shift
- C. Hyperregenerative left shift
- D. Degenerative left shift
- E. Regenerative-degenerative left shift

58. A 42-year-old patient complains of pain in the epigastral area, vomiting; vomit masses have the color of coffee-grounds; the patient suffers from melena. Anamnesis records gastric ulcer disease. Blood formula: erythrocytes – $2,8 \cdot 10^{12}/l$, leukocytes – $8 \cdot 10^9/l$, Hb – 90 g/l. What complication is it?

- A. Hemorrhage
- B. Penetration
- C. Perforation
- D. Canceration
- E. Pyloric stenosis

59. Examination of a 52-year-old woman has revealed a decrease in the amount of red blood cells and an increase in free hemoglobin in the blood plasma (hemoglobinemia). Color index is 0,85.

60. What type of anemia is being observed in the patient?

- A. Acquired hemolytic
- B. Hereditary hemolytic
- C. Acute hemorrhagic
- D. Chronic hemorrhagic
- E. Anemia due to diminished erythropoiesis

61. Along with normal hemoglobin types there can be pathological ones in the organism of an adult. Name one of them:

- A. HbS
- B. HbF
- C. HbA₁
- D. HbA₂
- E. HbO₂

62. A 50-year-old man suffering from chronic hepatitis frequently observes nasal and gingival hemorrhages, spontaneous hemorrhagic rashes on the skin and mucosa. Such presentations result from:

- A. Decreased synthesis of prothrombin and fibrinogen
- B. Increased blood content of aminotransferases
- C. Decreased synthesis of serum albumins
- D. Increased blood content of macroglobulins and cryoglobulins
- E. Decreased blood content of cholinesterase

63. A 30-year-old patient's blood test has revealed the following: erythrocyte count is $6 \cdot 10^{12}/l$, hemoglobin is 10.55 mmol/l. Vaquez's disease was diagnosed. Name the leading part of pathogenesis:

- A. Neoplastic erythroid hyperplasia
- B. Iron-deficiency
- C. B12-deficiency
- D. Hypoxia
- E. Acidosis

64. A patient is 20 years old, an athlete. He addressed a doctor with complaints of fatigue, fever up to 38°C – 40°C. Objectively: the liver and spleen are enlarged, lymph nodes on palpation are slightly enlarged, dense, painless. Blood test: Hb – 100 g/l; erythrocytes – $2.9 \cdot 10^{12}/l$; leukocytes – $4.4 \cdot 10^9/l$. Leukogram: 68% of blast cells. Cytochemical investigation of blast cells revealed negative reactions to glycogen, peroxidase, non-specific esterase, lipids. Name this disease:

- A. Acute undifferentiated leukemia
- B. Acute myeloid leukemia
- C. Acute monoblastic leukemia
- D. Acute lymphoblastic leukemia
- E. Acute megakaryoblastic leukemia

Module 5

1. A patient in three weeks after acute myocardial infarction has pain in the heart and joints and pneumonia. What is the main mechanism of development of postinfarction Dressler's syndrome?
 - A. Autoimmune inflammation
 - B. Ischemia of myocardium
 - C. Resorption of enzymes from necrotized area of myocardium
 - D. Secondary infection
 - E. Vessels' thrombosis
2. Electrocardiogram of a 45-year-old man showed absence of P-wave in all the leads. What part of the conducting system is blocked?
 - A. Sinu-atrial node
 - B. Atrioventricular node
 - C. Common branch of the bundle of His
 - D. Branches of the bundle of His
 - E. Purkinje's fibres
3. A person has steady HR not exceeding 40 bpm. What is the pacemaker of the heart rhythm in this person?
 - A. Atrioventricular node
 - B. Sinoatrial node
 - C. His' bundle
 - D. Branches of His' bundle
 - E. Purkinje' fibers
4. X-ray examination discovered lungs emphysema in the patient. What is the reason of short breath development in this case?
 - A. Decreased lungs elasticity
 - B. Increased lungs elasticity
 - C. Inhibition of respiratory center
 - D. Excitation of respiratory center
 - E. Decreasing of alveoli receptors sensitivity
5. A 62-year-old patient was admitted to the neurological department due to cerebral haemorrhage. His condition is grave. There is evident progression of deep and frequent breath that turns into reduction to apnoea and the cycle repeats. What respiration type has developed in the patient?
 - A. Cheyne-Stockes respiration
 - B. Kussmaul respiration
 - C. Biot's respiration
 - D. Gasping respiration
 - E. Apneustic respiration
6. After the trauma, the patient's right n.vagus was damaged. Which violation of the cardiac activity is possible in this case?
 - A. Violation of the automatism of a Kiss-Fleck node
 - B. Violation of the automatism of a atrioventricular node
 - C. Violation of a conductivity in the right auricle
 - D. Block of a conductivity in the atrioventricular node
 - E. Arrhythmia

7. A patient has a transverse disruption of spinal cord below the IV thoracic segment. What changes of respiration will it cause?
- Respiration will stay unchanged
 - Respiration will stop
 - Respiration will become less frequent
 - Respiration will become deeper
 - Respiration will become more frequent
8. 12 hours after an acute attack of retrosternal pain a patient presented a jump of aspartate aminotransferase activity in blood serum. What pathology is this deviation typical for?
- Myocardium infarction
 - Viral hepatitis
 - Collagenosis
 - Diabetes mellitus
 - Diabetes insipidus
9. A peripheral segment of vagus nerve on a dog's neck was being stimulated in course of an experiment. The following changes of cardiac activity could be meanwhile observed:
- Heart rate fall
 - Heart hurry
 - Enhancement of atrioventricular conduction
 - Heart rate and heart force amplification
 - Increased excitability of myocardium
10. A 12 y.o. boy who suffers from bronchial asthma has an acute attack of asthma: evident expiratory dyspnea, skin pallor. What type of alveolar ventilation disturbance is it?
- Obstructive
 - Restrictive
 - Thoracodiaphragmatic
 - Central
 - Neuromuscular
11. A group of mountain climbers went through the blood analysis at the height of 3000 m. It revealed decrease of HCO_3^- to 15 micromole/l (standard is 22- 26 micromole/l). What is the mechanism of HCO_3^- decrease?
- Hyperventilation
 - Intensification of acidogenesis
 - Hypoventilation
 - Decrease of ammoniogenesis
 - Decrease of bicarbonate reabsorption in kidneys
12. A patient who suffers from severe disorder of water-salt metabolism experienced cardiac arrest in diastole. What is the most probable mechanism of cardiac arrest in diastole?
- Hyperkalemia
 - Hypernatremia
 - Organism dehydration
 - Hypokalemia
 - Hyponatremia
13. Examination of coronary arteries revealed atherosclerotic calcific plaques that close vessel lumen by 1/3. The muscle has multiple whitish layers of connective tissue. What process was revealed in myocardium?

- A. Diffuse cardiosclerosis
- B. Tiger heart
- C. Postinfarction cardiosclerosis
- D. Myocarditis
- E. Myocardium infarction

14. Examination of a miner revealed pulmonary fibrosis accompanied by disturbance of alveolar ventilation. What is the main mechanism of this disturbance?

- A. Limitation of respiratory surface of lungs
- B. Constriction of superior respiratory tracts
- C. Disturbance of neural respiration control
- D. Limitation of breast mobility
- E. Bronchi spasm

15. A 49 y.o. woman consulted a doctor about heightened fatigue and dyspnea during physical activity. ECG: heart rate is 50/min, PQ is extended, QRS is unchanged, P wave quantity exceeds quantity of QRS complexes. What type of arrhythmia does the patient have?

- A. Atrioventricular block
- B. Extrasystole
- C. Sinus bradycardia
- D. Ciliary arrhythmia
- E. Sinoatrial block

16. A patient is followed up in an endocrinological dispensary on account of hyperthyreosis. Weight loss, tachycardia, finger tremor are accompanied by hypoxia symptoms - headache, fatigue, eye flicker. What mechanism of thyroid hormones action underlies the development of hypoxia?

- A. Disjunction, oxydation and phosphorilation
- B. Inhibition of respiratory ferment synthesis
- C. Competitive inhibition of respiratory ferments
- D. Intensification of respiratory ferment synthesis
- E. Specific binding of active centres of respiratory ferments

17. A 56 y.o. patient has been suffering from thyreotoxicosis for a long time. What type of hypoxia can be developed?

- A. Tissue
- B. Hemic
- C. Circulatory
- D. Respiratory
- E. Mixed

18. A patient has extrasystole. ECG shows no P wave, QRS complex is deformed, there is a full compensatory pause. What extrasystoles are these?

- A. Ventricular
- B. Atrial
- C. Atrioventricular
- D. Sinus
- E. –

19. ECG of a patient with hyperfunction of thyroid gland showed heart hurry. It is indicated by depression of the following ECG element:

- A. R – R interval
- B. P – Q segment

- C. P – Q interval
- D. P – T interval
- E. QRS complex

20. An animal with aortic valve insufficiency got hypertrophy of its left heart ventricle. Some of its parts have local contractures. What substance accumulated in the myocardiocytes caused these contractures?

- A. Calcium
- B. Potassium
- C. Lactic acid
- D. Carbon dioxide
- E. Sodium

21. Prophylactic medical examination of a 36 year old driver revealed that his AP was 150/90 mm Hg. At the end of working day he usually hears ear noise, feels slight indisposition that passes after some rest. He was diagnosed with essential hypertension. What is the leading pathogenetic mechanism in this case?

- A. Neurogenetic
- B. Nephric
- C. Humoral
- D. Endocrinal
- E. Reflexogenic

22. An unconscious young man with signs of morphine poisoning entered admission office. His respiration is shallow and infrequent which is caused by inhibition of respiratory centre. What type of respiratory failure is it?

- A. Ventilative dysregulatory
- B. Ventilative obstructive
- C. Ventilative restrictive
- D. Perfusive
- E. Diffusive

23. In course of a preventive examination of a miner a doctor revealed changes of cardiovascular fitness which was indicative of cardiac insufficiency at the compensation stage. What is the main proof of cardiac compensation?

- A. Myocardium hypertrophy
- B. Tachycardia
- C. Rise of arterial pressure
- D. Dyspnea
- E. Cyanosis

24. In course of an experiment a peripheral section of vagus of an experimental animal is being stimulated. What changes will be observed?

- A. Heart rate fall
- B. Heart hurry
- C. Pupil dilation
- D. Increase of respiration rate
- E. Bronchi dilation

25. Vagi of an experimental animal were cut on both sides. What respiration changes will be observed?

- A. It will become deep and infrequent

- B. It will become shallow and frequent
- C. It will become deep and frequent
- D. It will become shallow and infrequent
- E. No changes will be observed

26. A patient ill with essential arterial hypertension had a hypertensive crisis that resulted in an attack of cardiac asthma. What is the leading mechanism of cardiac insufficiency in this case?

- A. Heart overload caused by high pressure
- B. Heart overload caused by increased blood volume
- C. Absolute coronary insufficiency
- D. Myocardium damage
- E. Blood supply disturbance

27. ECG of a 44-year-old patient shows signs of hypertrophy of both ventricles and the right atrium. The patient was diagnosed with the tricuspid valve insufficiency. What pathogenetic variant of cardiac dysfunction is usually observed in case of such insufficiency?

- A. Heart overload by volume
- B. Heart overload by resistance
- C. Primary myocardial insufficiency
- D. Coronary insufficiency
- E. Cardiac tamponade

28. After a serious psycho-emotional stress a 45-year-old patient suddenly felt constricting heart pain irradiating to the left arm, neck and left scapula. His face turned pale, the cold sweat stood out on it. The pain attack was stopped with nitroglycerine. What process has developed in this patient?

- A. Stenocardia
- B. Myocardial infarction
- C. Stroke
- D. Psychogenic shock
- E. Stomach ulcer perforation

29. While eating a child choked on food and aspirated it. The child has severe cough, cyanotic skin and mucous membranes, rapid pulse, infrequent respiration, prolonged expiration. The child has developed the following disorder of the external respiration:

- A. Expiratory dyspnea under asphyxia
- B. Inspiratory dyspnea under asphyxia
- C. Stenotic respiration
- D. Alternating respiration
- E. Biot's respiration

30. A 12-year-old adolescent suffering from bronchial asthma has a severe attack of asthma: he presents with marked expiratory dyspnea, skin pallor. What type of alveolar ventilation disorder is observed?

- A. Obstructive
- B. Restrictive
- C. Thoracodiaphragmatic
- D. Central
- E. Neuromuscular

31. ECG of a patient shows such alterations: P-wave is normal, P – Q-interval is short, ventricular QRST complex is wide, R-wave is double-peak or two-phase. What form of arrhythmia is it?

- A. WPW syndrome (Wolff-Parkinson-White)

- B. Frederick's syndrome (atrial flutter)
- C. Atrioventricular block
- D. Ventricular fibrillation
- E. Ciliary arrhythmia

32. In a healthy adult speed of the excitement conduction through the atrioventricular node is 0,02-0,05 m/sec. Atrioventricular delay enables:

- A. Sequence of atrial and ventricular contractions
- B. Simultaneity of both atria contractions
- C. Simultaneity of both ventricles contractions
- D. Sufficient force of atrial contractions
- E. Sufficient force of ventricular contractions

33. A 49-year-old patient consulted a doctor about increased fatigability and dyspnea provoked by physical activity. ECG results: heart rate - 50/min, PQ-interval is prolonged, QRS-complex is unchanged, the number of P-waves exceeds the number of QRS-complexes. What type of arrhythmia is it?

- A. Atrioventricular block
- B. Extrasystole
- C. Sinus bradycardia
- D. Ciliary arrhythmia
- E. Sinoatrial block

34. A 58-year-old patient suffers from the cerebral atherosclerosis. Examination revealed hyperlipidemia. What class of lipoproteins will most probably show increase in concentration in this patient's blood serum?

- A. Low-density lipoproteins
- B. High-density lipoproteins
- C. Fatty acid complexes with albumins
- D. Chylomicrons
- E. Cholesterol

35. A 63 year old male patient who had been suffering from chronic diffuse obstructive disease, pulmonary emphysema, for 15 years died from cardiac insufficiency. Autopsy revealed nutmeg liver cirrhosis, cyanotic induration of kidneys and spleen, ascites, edemata of lower limbs. These changes of internal organs are typical for the following disease:

- A. Chronic right-ventricular insufficiency
- B. Acute right-ventricular insufficiency
- C. Chronic left-ventricular insufficiency
- D. Acute left-ventricular insufficiency
- E. General cardiac insufficiency

36. A patient staying in the pulmonological department was diagnosed with pulmonary emphysema accompanied by reduced elasticity of pulmonary tissue. What type of respiration is observed?

- A. Expiratory dyspnea
- B. Inspiratory dyspnea
- C. Superficial respiration
- D. Infrequent respiration
- E. Periodic respiration

37. An unconscious young man with signs of morphine poisoning entered admission office. His respiration is shallow and infrequent which is caused by inhibition of respiratory centre. What type of respiratory failure is it?
- A. Ventilative dysregulatory
 - B. Ventilative obstructive
 - C. Ventilative restrictive
 - D. Perfusive
 - E. Diffusive
38. Voluntary breath-holding caused increase of respiration depth and frequency. The main factor stimulating these changes of external respiration is:
- A. Increased tension of CO₂ in blood
 - B. Increased tension of O₂ in blood
 - C. Decreased tension of O₂ in blood
 - D. Decreased tension of CO₂ in blood
 - E. Decreased concentration of H⁺ in blood
39. 12 hours after an acute attack of retrosternal pain a patient presented a jump of aspartate aminotransferase activity in blood serum. What pathology is this deviation typical for?
- A. Myocardium infarction
 - B. Viral hepatitis
 - C. Collagenosis
 - D. Diabetes mellitus
 - E. Diabetes insipidus
40. A 38-year-old man died in the attempt of lifting weight. He had collapse state. Autopsy revealed an extensive aneurism rupture of thoracic aorta. He suffered from visceral syphilis during his lifetime. What pathological process caused weakness of aortic wall, its dilatation and rupture?
- A. Vanishing of elastic fibers
 - B. Vanishing of collagen fibers
 - C. Muscle layer atrophy
 - D. Intima changes by shagreen leather type
 - E. Vascularization
41. A patient with coronary disease has been diagnosed with myocardial hypertrophy, tachycardia and a decrease in minute blood volume. What is the leading mechanism of cardiac myocyte damage in this case?
- A. Damage of specific membrane pumps
 - B. Increase in α and β adrenoceptors quantity
 - C. Mg²⁺ loss by cardiac myocytes
 - D. Ca²⁺ loss by cardiac myocytes
 - E. Cardiac myocyte dehydration
42. A 49-year old female patient has limitation of left limbs arbitrary movements. Muscular tonus of left hand and leg is overstrained and spasmodic, local tendon reflexes are strong, pathological reflexes are presented. What is the most likely development mechanism of hypertension and hyperreflexia?
- A. Reduction of descending inhibitory influence
 - B. Motoneuron activation induced by stroke
 - C. Activation of excitatory influence from the focus of stroke
 - D. Activation of synaptic transmission
 - E. Inhibition of cerebral cortex motoneurons

43. A 55-year-old patient was admitted to the cardiological department. ECG data: negative P wave overlaps QRS complex, diastolic interval is prolonged after extrasystole. What type of extrasystole is it?
- A. Atrioventricular
 - B. Sinus
 - C. Atrial
 - D. Ventricular
 - E. Bundle-branch
44. A patient with marked pneumofibrosis that developed after infiltrating pulmonary tuberculosis has been diagnosed with respiratory failure. What is its pathogenetic type?
- A. Restrictive
 - B. Obstructive
 - C. Dysregulatory
 - D. Reflex
 - E. Apneistic
45. A 29-year-old man developed acute heart failure while running for a long time. What changes in ionic composition can be observed in the cardiac muscle?
- A. Accumulation of Na^+ and Ca^{2+} ions in the myocardium cells
 - B. Accumulation of K^+ and Mg^{2+} ions in the myocardium cells
 - C. Reduction of Na^+ and Ca^{2+} ions in the myocardium cells
 - D. Reduction of K^+ and Mg^{2+} ions in the extracellular space
 - E. Reduction of Na^+ and Ca^{2+} ions in the extracellular space
46. A patient has a trauma of sternocleidomastoid muscle. This caused a decrease in value of the following indicator of external respiration:
- A. Inspiratory reserve volume
 - B. Expiratory reserve volume
 - C. Respiratory capacity
 - D. Residual volume
 - E. Functional residual lung capacity
47. After an attack of bronchial asthma a patient had his peripheral blood tested. What changes can be expected?
- A. Eosinophilia
 - B. Leukopenia
 - C. Lymphocytosis
 - D. Thrombocytopenia
 - E. Erythrocytosis
48. A 61-year old patient suffers from essential hypertension. After a physical stress he experienced muscle weakness, breathlessness, cyanosis of lips, skin and face. Respiration was accompanied by distinctly heard bubbling rales. What mechanism underlies the development of this syndrome?
- A. Acute left-ventricular failure
 - B. Chronic right-ventricular failure
 - C. Chronic left-ventricular failure
 - D. Collapse
 - E. Cardiac tamponade

49. From the group of children who were eating sweet sappy watermelon two kids developed the signs of poisoning: rapid weakness, dizziness, headache, vomiting, edema, tachycardia, cyanosis of mouth, ears, tips of the fingers cyanosis. High concentration of nitrates was detected. What is the leading mechanism of the pathogenesis of the poisoning in the two children?

- A. Insufficiency of met-Hb-reductase
- B. Insufficiency of superoxidismutase
- C. Block cytochrome oxidase
- D. Insufficiency glutathione pyroxidase
- E. Insufficiency of catalase

50. A 59-year old male patient who had been suffering from chronic diffuse obstructive disease, pulmonary emphysema, for 15 years died from cardiac insufficiency. Autopsy revealed nutmeg liver cirrhosis, cyanotic induration of kidneys and spleen, ascites, edemata of lower limbs. These changes of internal organs are typical for the following disease:

- A. Chronic right-ventricular insufficiency
- B. Acute right-ventricular insufficiency
- C. Chronic left-ventricular insufficiency
- D. Acute left-ventricular insufficiency
- E. General cardiac insufficiency

51. After a serious psychoemotional stress a 48 year old patient suddenly developed acute heart ache irradiating to the left arm. Nitroglycerine relieved pain after 10 minutes. What is the leading pathogenetic mechanism of this process development?

- A. Spasm of coronary arteries
- B. Dilatation of peripheral vessels
- C. Obstruction of coronary vessels
- D. Compression of coronary vessels
- E. Increase in myocardial oxygen consumption

52. The patient with acute myocardial infarction was given intravenously different solutions during 8 hours with medical dropper 1500 ml and oxygen intranasally. He died because of pulmonary edema. What caused the pulmonary edema?

- A. Volume overload of the left ventricular
- B. Decreased oncotic pressure due to hemodilution
- C. Allergic reaction
- D. Neurogenic reaction
- E. Inhalation of the oxygen

53. Autopsy of a 75 year old patient who had been suffering from disseminated atherosclerosis and died under chronic cardiac failure revealed constriction and deformation of coronary arteries, tuberos intima whose section appeared to be white and petrosal. Specify the stage of atherosclerosis morphogenesis:

- A. Atherocalcinosis
- B. Lipoidosis
- C. Liposclerosis
- D. Bilipid
- E. Atheromatosis

54. A 67 year old patient complains of periodic heart ache, dyspnea during light physical activities. ECG reveals extraordinary contractions of heart ventricles. Such arrhythmia is called:

- A. Extrasystole
- B. Bradycardia

- C. Tachycardia
- D. Flutter
- E. Fibrillation

55. A 23-year-old patient has been admitted to a hospital with a craniocerebral injury. The patient is in a grave condition. Respiration is characterized by prolonged convulsive inspiration followed by a short expiration. What kind of respiration is it typical for?

- A. Apneustic
- B. Gasping breath
- C. Kussmaul's
- D. Cheyne-Stokes
- E. Biot's

56. A patient with bronchial asthma has developed acute respiratory failure. What kind of respiratory failure occurs in this case?

- A. Obstructive disturbance of alveolar ventilation
- B. Restrictive ventilatory defect
- C. Perfusion
- D. Diffusion
- E. Dysregulation of alveolar ventilation

57. Measurements of the arterial pCO₂ and pO₂ during an attack of bronchial asthma revealed hypercapnia and hypoxemia respectively. What kind of hypoxia occurred in this case?

- A. Respiratory
- B. Hemic
- C. Circulatory
- D. Tissue
- E. Histotoxic

58. Autopsy of a 78-year-old patient revealed that retroperitoneal tissue was soaked with blood, the abdominal aorta had a sacciform protrusion including a defect with irregular edges. The wall of the aorta was here and there of stone-like density. This is the complication of the following disease:

- A. Atherosclerosis
- B. Essential hypertension
- C. Systemic vasculitis
- D. Visceral syphilis
- E. Marfan syndrome

59. Diseases of the respiratory system and circulatory disorders impair the transport of oxygen, thus leading to hypoxia. Under these conditions the energy metabolism is carried out by anaerobic glycolysis. As a result, the following substance is generated and accumulated in blood:

- A. Lactic acid
- B. Pyruvic acid
- C. Glutamic acid
- D. Citric acid
- E. Fumaric acid

60. Analysis of the ECG revealed the missing of several PQRST cycles. The remaining waves and complexes are not changed. Specify the type of arrhythmia:

- A. Sinoatrial block
- B. Atrial fibrillation
- C. Atrioventricular block

- D. Atrial premature beat
- E. Intra-atrial block

61. Since a patient has had myocardial infarction, atria and ventricles contract independently from each other with a frequency of 60-70 and 35-40 per minute. Specify the type of heart block in this case:

- A. Complete atrioventricular
- B. Partial atrioventricular
- C. Sino-atrial
- D. Intra-atrial
- E. Intraventricular

62. A patient with extensive myocardial infarction has developed heart failure. What pathogenetic mechanism contributed to the development of heart failure in the patient?

- A. Reduction in the mass of functioning myocytes
- B. Pressure overload
- C. Volume overload
- D. Acute cardiac tamponade
- E. Myocardial reperfusion injury

63. Analysis of the experimental spirogram of a 55-year-old person revealed a decrease in tidal volume and respiratory amplitude compared to the situation of ten years ago. The change in these indicators is caused by:

- A. Decreased force of respiratory muscle contraction
- B. Gas composition of the air
- C. Physical build of a person
- D. Height of a person
- E. Body mass of a person

64. A patient underwent a course of treatment for atherosclerosis. Laboratory tests revealed an increase in the antiatherogenic lipoprotein fraction in the blood plasma. The treatment efficacy is confirmed by the increase in:

- A. HDL
- B. VLDL
- C. IDL
- D. LDL
- E. Chylomicrons

65. A patient has increased thickness of alveolar-capillary membrane caused by a pathologic process. The direct consequence will be reduction of the following value:

- A. Diffusing lung capacity
- B. Oxygen capacity of blood
- C. Respiratory minute volume
- D. Alveolar ventilation of lungs
- E. Expiratory reserve volume

66. A 43-year-old-patient has arterial hypertension caused by an increase in cardiac output and general peripheral resistance. Specify the variant of hemodynamic development of arterial hypertension in the given case:

- A. Eukinetic
- B. Hyperkinetic
- C. Hypokinetic

D. Combined

E. –

67. When studying the signs of pulmonary ventilation, reduction of forced expiratory volume has been detected. What is the likely cause of this phenomenon?

A. Obstructive pulmonary disease

B. Increase of respiratory volume

C. Increase of inspiratory reserve volume

D. Increase of pulmonary residual volume

E. Increase of functional residual lung capacity

68. Since a patient has had myocardial infarction, his atria and ventricles contract independently from each other with a frequency of 60-70 and 35-40 per minute. Specify the type of heart block in this case:

A. Complete atrioventricular

B. Partial atrioventricular

C. Sino-atrial

D. Intra-atrial

E. Intraventricular

69. The resuscitation unit has admitted a patient in grave condition. It is known that he had mistakenly taken sodium fluoride which blocks cytochrome oxidase. What type of hypoxia developed in the patient?

A. Tissue

B. Hemic

C. Cardiovascular

D. Hypoxic

E. Respiratory

70. A public utility specialist went down into a sewer well without protection and after a while lost consciousness. Ambulance doctors diagnosed him with hydrogen sulfide intoxication. What type of hypoxia developed?

A. Hemic

B. Overload

C. Tissue

D. Circulatory

E. Respiratory

71. A patient with hypertensive crisis has increased content of angiotensin II in blood. Angiotensin pressor effect is based on:

A. Contraction of arteriole muscles

B. Activation of biogenic amine synthesis

C. Prostaglandin hyperproduction

D. Vasopressin production stimulation

E. Activation of kinin–kallikrein system

72. When studying the signs of pulmonary ventilation, reduction of forced expiratory volume has been detected. What is the likely cause of this phenomenon?

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73. Diseases of respiratory system and circulatory disorders impair the transport of oxygen, thus causing hypoxia. Under these conditions the energy metabolism is carried out by anaerobic glycolysis. As a result, the following substance is generated and accumulated in blood:

- A. Lactic acid
- B. Pyruvic acid
- C. Glutamic acid
- D. Citric acid
- E. Fumaric acid

74. Cholesterol content in blood serum of a 12-year-old boy is 25 mmol/l. Anamnesis states hereditary familial hypercholesterolemia caused by synthesis disruption of receptor-related proteins for:

- A. Low-density lipoproteins
- B. High-density lipoproteins
- C. Chylomicrons
- D. Very low-density lipoproteins
- E. Middle-density lipoproteins

75. A 30-year-old man has sustained an injury to his thorax in a traffic incident, which caused disruption of his external respiration. What type of ventilatory difficulty can be observed in the given case?

- A. Restrictive extrapulmonary ventilatory impairment
- B. Restrictive pulmonary ventilatory impairment
- C. Obstructive ventilatory impairment
- D. Impaired ventilation regulation dysfunction
- E. Cardiovascular collapse

76. A patient demonstrates sharp decrease of pulmonary surfactant activity. This condition can result in:

- A. Alveolar tendency to recede
- B. Decreased airways resistance
- C. Decreased work of expiratory muscles
- D. Increased pulmonary ventilation
- E. Hyperoxemia

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

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

78. A 51-year-old patient complains of periodic heartache, dyspnea during light physical activities. ECG reveals extraordinary contractions of heart ventricles. Such arrhythmia is called:

- A. Extrasystole
- B. Bradycardia
- C. Tachycardia
- D. Flutter

E. Fibrillation

79. A woman resting in the countryside has been stung by a bee. Immediately after she developed pain in the stung area. In a few minutes there developed a vesicle, erythema and intense itch; later – urticarial and expiratory dyspnea. What factors resulted in the patient developing expiratory dyspnea?

- A. Histamine
- B. Hageman's factor
- C. Lysosomal enzymes
- D. Noradrenaline
- E. Adrenaline

80. When ascending to the top of Elbrus, a mountain climber experiences oxygen starvation, dyspnea, palpitations, and numbness of the extremities. What kind of hypoxia has developed in the mountain climber?

- A. Hypoxic
- B. Circulatory
- C. Hemic
- D. Tissue
- E. Cardiac

81. A patient complains of palpitations after stress. Pulse is 104/min., P-Q = 0,12 seconds, there are no changes in QRS complex. What type of arrhythmia does the patient have?

- A. Sinus tachycardia
- B. Sinus bradycardia
- C. Sinus arrhythmia
- D. Ciliary arrhythmia
- E. Extrasystole

82. An athlete (long-distance runner) during a contest developed a case of acute cardiac insufficiency. This pathology resulted from:

- A. Cardiac volume overload
- B. Disrupted coronary circulation
- C. Direct damage to myocardium
- D. Pericardium pathology
- E. Cardiac pressure overload

Module 6

1. Purulent endometritis developed in a woman after delivery. Treating with antibiotics inhibitors of murein synthesis was ineffective. Wide spectrum bactericidal antibiotic was administered to her. In 6 hours temperature rapidly increased up to 40 C with shiver. Muscle pains have appeared. BP dropped down to 70/40 mmHg. Oliguria has developed. What is the main reason for the development of this condition?
 - A. Endotoxic shock
 - B. Toxic effect of preparation
 - C. Internal bleeding
 - D. Anaphylactic shock
 - E. Bacteremia
2. A 2-year-old child experienced convulsions because of lowering calcium ions concentration in the blood plasma. Function of what structure is decreased?
 - A. Parathyroid glands
 - B. Hypophysis
 - C. Adrenal cortex
 - D. Pineal gland
 - E. Thymus
3. A patient after hypertension stroke does not have voluntary movements in his right arm and leg with the increased muscle tone in these extremities. What type of disfunction of nervous system is it?
 - A. Central paralysis
 - B. Peripheral paralysis
 - C. Peripheral paresis
 - D. Reflex paresis
 - E. Central paresis
4. The patient has come to the hospital from the smelting workshop in the condition of hyperthermia. What is the direct cause of loss of consciousness at the heat stroke?
 - A. Decreased brain blood supply
 - B. Arterial pressure drop
 - C. Increased water loss through sweating
 - D. Decrease of heart output
 - E. Dilatation of peripheral vessels
5. A 16 year-old patient got numerous traumas in automobile accident. Now the patient is having a shock. AP - 80/60 mm Hg. daily urine volume 60-80 ml. What pathogenic mechanism leads to kidneys function violation?
 - A. Decreased hydrostatic pressure in glomerular capillaries
 - B. Increased osmotic pressure in glomerular capillaries
 - C. Increased pressure in Bowman's capsule
 - D. Increased vasopressin blood concentration
 - E. Trauma of the urinary bladder
6. An autopsy has revealed that kidneys are enlarged, surface is large-granular because of multiple cavities with smooth wall, which are filled with clear fluid. What kidney disease did the patient have?
 - A. Polycystic kidney

- B. Necrotic nephrosis
- C. Pyelonephritis
- D. Glomerulonephritis
- E. Infarction

7. A 57-year-old patient was admitted to the gastroenterological department with suspicion of Zollinger-Ellison syndrome because of rapid increase of gastrin level in the blood serum. What the most probable disorder of the secretory function of the stomach here?

- A. Hyperacidity hypersecretion
- B. Hyperacidity hyposecretion
- C. Achylia
- D. Hypoacidity hyposecretion
- E. Hypoacidity hypersecretion

8. M-r S presents all signs of the hepatic coma: loss of consciousness, absence of reflexes, cramps, convulsion, disorder of heart activity, recurrent (periodical) respiration. What are cerebrotoxic substances which accumulate in blood under hepar insufficiency?

- A. Ammonia
- B. IL-1
- C. Autoantibody
- D. Necrosogenic substances
- E. Ketonic body

9. A 19-year-old female suffers from tachycardia in rest condition, weight loss, excessive sweating, exophthalmos and irritability. What hormone would you expect to find elevated in her serum?

- A. Thyroxine
- B. Cortisol
- C. Mineralocorticoids
- D. ACTH
- E. Insulin

10. A patient with the symptoms of acute alcoholic poisoning was brought to the hospital. What carbohydrates metabolism changes are typical for this condition?

- A. The gluconeogenesis velocity in liver is decreased
- B. The gluconeogenesis is increased in liver
- C. The breakage of glycogen is increased in liver
- D. The anaerobic glucose metabolism predominates in muscles
- E. The anaerobic breakage of glucose is increased in muscles

11. A 59-year-old man has symptoms of parenchymatous jaundice and portal hypertension. Histological examination of the puncture of the liver biopate has revealed an affected beam-lobule structure, part of hepatocytes has signs of fat dystrophy, port-portal connective tissue septa with formation of pseudo-lobules, with periportal lymphomacrophage infiltrations. What is the most probable diagnosis?

- A. Liver cirrhosis
- B. Alcohol hepatitis
- C. Chronic hepatitis
- D. Viral hepatitis
- E. Toxic dystrophy

12. Glomerular filtration rate (GFR) increased by 20% due to prolonged starvation of the person. The most evident cause of filtration changes under this conditions is:

- A. Decrease of oncotic pressure of blood plasma
- B. Increase of systemic blood pressure
- C. Increase of penetration of the renal filter
- D. Increase of filtration coefficient
- E. Increase of renal plasma stream

13. A 68-year-old woman can not move her upper and lower right extremities after stroke. Muscle tone of these extremities and reflexes are increased. There are pathological reflexes. What form of the paralysis is it?

- A. Hemiplegia
- B. Paraplegia
- C. Tetraplegia
- D. Monoplegia
- E. Dissociation

14. Ammonia is a very toxic substance, especially for nervous system. What substance takes the most active part in ammonia detoxication in brain tissues?

- A. Glutamic acid
- B. Lysine
- C. Proline
- D. Histidine
- E. Alanine

15. A patient complains of frequent diarrheas, especially after consumption of fattening food, and of body weight loss. Laboratory examination revealed steatorrhea; hypocholic feces. What can be the cause of this condition?

- A. Obturation of biliary tracts
- B. Mucous membrane inflammation of small intestine
- C. Lack of pancreatic lipase
- D. Lack of pancreatic phospholipase
- E. Unbalanced diet

16. A child is languid, apathetic. Liver is enlarged and liver biopsy revealed a significant excess of glycogene. Glucose concentration in the blood stream is below normal. What is the cause of low glucose concentration?

- A. Low (absent) activity of glycogene phosphorylase in liver
- B. Low (absent) activity of hexokinase
- C. High activity of glycogen synthetase
- D. Low (absent) activity of glucose 6-phosphatase
- E. Deficit of a gene that is responsible for synthesis of glucose 1-phosphaturidine transferase

17. After intake of rich food a patient feels nausea and sluggishness; with time there appeared signs of steatorrhea. Blood cholesterine concentration is 9,2 micromole/l. This condition was caused by lack of:

- A. Bile acids
- B. Triglycerides
- C. Fatty acids
- D. Phospholipids
- E. Chylomicrons

18. A 2 y.o. child has convulsions as a result of lowered concentration of calcium ions in blood plasma. It is caused by reduced function of:

- A. Parathyroid glands
- B. Hypophysis
- C. Adrenal cortex
- D. Pineal gland
- E. Thymus

19. A 48 y.o. patient was admitted to the hospital with complaints about weakness, irritability, sleep disturbance. Objectively: skin and scleras are yellow. In blood: conjugated bilirubin, cholemia. Feces are acholic. Urine is of dark colour (bilirubin). What jaundice is it?

- A. Mechanic
- B. Hemolytic
- C. Parenchymatous
- D. Gilbert's syndrome
- E. Crigler-Najjar syndrome

20. 40 y.o. patient complains of intensive heartbeats, sweating, nausea, vision impairment, arm tremor, hypertension. From his anamnesis: 2 years ago he was diagnosed with pheochromocytoma. Hyperproduction of what hormones causes the given pathology?

- A. Catecholamines
- B. Aldosterone
- C. Glucocorticoids
- D. ACTH
- E. Thyroid hormones

21. A 4 y.o. boy has had recently serious viral hepatitis. Now there are such clinical presentations as vomiting, loss of consciousness, convulsions. Blood analysis revealed hyperammonemia. Disturbance of which biochemical process caused such pathological condition of the patient?

- A. Disturbed neutralization of ammonia in liver
- B. Disturbed neutralization of biogenic amines
- C. Increased putrefaction of proteins in bowels
- D. Activation of aminoacid decarboxylation
- E. Inhibition of transamination enzymes

22. A patient has a disturbed absorption of fat hydrolyses. It might have been caused by a deficit in the small intestine cavity:

- A. Of bile acids
- B. Of bile pigments
- C. Of lipolytic enzymes
- D. Of sodium ions
- E. Of liposoluble vitamins

23. Violation of safety rules resulted in calomel intoxication. Two days later the daily diuresis was 620 ml. A patient experienced headache, vomiting, convulsions, dyspnea, moist rales in lungs. What pathology is it?

- A. Acute renal insufficiency
- B. Chronic renal insufficiency
- C. Uraemic coma
- D. Glomerulonephritis
- E. Pyelonephritis

24. Autopsy of a 56 y.o. man revealed in the right temporal part of brain a big focus of softened grey matter that was semiliquid and light grey. Arteries of cerebral tela contain multiple whitish-yellow thickenings of intima that abruptly narrow the lumen. What is your diagnosis?
- A. Ischemic stroke
 - B. Brain abscess
 - C. Hemorrhage
 - D. Hemorrhagic infarction
 - E. Brain edema
25. After consumption of rich food a patient has nausea and heartburn, steatorrhea. This condition might be caused by:
- A. Bile acid deficiency
 - B. Increased lipase secretion
 - C. Disturbed trypsin synthesis
 - D. Amylase deficiency
 - E. Disturbed phospholipase synthesis
26. An aged man had raise of arterial pressure under a stress. It was caused by activation of:
- A. Sympathoadrenal system
 - B. Parasympathetic nucleus of vagus
 - C. Functions of thyroid gland
 - D. Functions of adrenal cortex
 - E. Hypophysis function
27. As a result of long-term starvation the glomerular filtration of a man was accelerated by 20%. The most probable cause of filtration changes under such conditions is:
- A. Fall of oncotic pressure of blood plasma
 - B. Rise of systemic arterial pressure
 - C. Increased permeability of renal filter
 - D. Growth of filtration coefficient
 - E. Increase of renal plasma flow
28. A patient has yellow skin colour, dark urine, dark-yellow feces. What substance will have strengthened concentration in the blood serum?
- A. Unconjugated bilirubin
 - B. Conjugated bilirubin
 - C. Mesobilirubin
 - D. Verdoglobulin
 - E. Biliverdin
29. A 44 year old woman complains of general weakness, heart pain, significant increase of body weight. Objectively: moon face, hirsutism, AP is 165/100 mm Hg, height - 164 cm, weight - 103 kg; the fat is mostly accumulated on her neck, thoracic girdle, belly. What is the main pathogenetic mechanism of obesity?
- A. Increased production of glucocorticoids
 - B. Reduced production of thyroid hormones
 - C. Increased insulin production
 - D. Reduced glucagon production
 - E. Increased mineralocorticoid production
30. A girl is diagnosed with adrenogenital syndrome (pseudohermaphroditism). This pathology was caused by hypersecretion of the following adrenal hormone:

- A. Androgen
- B. Estrogen
- C. Aldosterone
- D. Cortisol
- E. Adrenalin

31. A cerebral trauma caused increased ammonia generation. What amino acid participates in the excretion of ammonia from the cerebral tissue?

- A. Glutamic
- B. Tyrosine
- C. Valine
- D. Tryptophan
- E. Lysine

32. A 30 year old woman has face edemata. Examination revealed proteinuria (5,87 g/l), hypoproteinemia, dysproteinemia, hyperlipidemia. What condition is the set of these symptoms typical for?

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

33. A patient has a decreased vasopressin synthesis that causes polyuria and as a result of it evident organism dehydration. What is the mechanism of polyuria development?

- A. Reduced tubular reabsorption of water
- B. Reduced tubular reabsorption of Na ions
- C. Reduced tubular reabsorption of protein
- D. Reduced glucose reabsorption
- E. Acceleration of glomerular filtration

34. A driver who got a trauma in a road accident and is shocked has reduction of daily urinary output down to 300 ml. What is the main pathogenetic factor of such diuresis change?

- A. Drop of arterial pressure
- B. Drop of oncotic blood pressure
- C. Increased vascular permeability
- D. Decreased number of functioning glomerules
- E. Secondary hyperaldosteronism

35. During starvation muscle proteins break up into free amino acids. These compounds will be the most probably involved into the following process:

- A. Gluconeogenesis in liver
- B. Gluconeogenesis in muscles
- C. Synthesis of higher fatty acids
- D. Glycogenolysis
- E. Decarboxylation

36. Rats being under stress have muscular hypertonia and high arterial pressure, high glucose concentration in blood and intensified secretion of corticotropin and corticosteroids. In what stress phase are these animals?

- A. Antishock phase
- B. Exhaustion

- C. Shock phase
- D. Erectile
- E. Terminal

37. After a hypertonic crisis a patient presents with lacking spontaneous movements in his right arm and leg, muscle tone of these extremities is increased. What type of motor dysfunction has developed in this case?

- A. Central paralysis
- B. Peripheral paralysis
- C. Peripheral paresis
- D. Reflectrory paresis
- E. Central paresis

38. A 46-year-old patient suffering from the diffuse toxic goiter underwent resection of the thyroid gland. After the surgery the patient presents with appetite loss, dyspepsia, increased neuromuscular excitement. The body weight remained unchanged. Body temperature is normal. Which of the following has caused such a condition in this patient?

- A. Reduced production of parathormone
- B. Increased production of thyroxin
- C. Increased production of calcitonin
- D. Increased production of thyroliberin
- E. Reduced production of thyroxin

39. A 48-year-old patient was admitted to the hospital with complaints about weakness, irritability, sleep disturbance. Objectively: skin and scleras are of yellow colour. In blood: increased concentration of total bilirubin with prevailing direct bilirubin. The feces are acholic. The urine is dark (contains bile pigments). What type of jaundice is it?

- A. Mechanic
- B. Haemolytic
- C. Parenchymatous
- D. Gilbert's syndrome
- E. Crigler-Najjar syndrome

40. Two weeks after lacunar tonsillitis a 20-year-old man started complaining about general weakness, lower eyelid edemata. After examination the patient was diagnosed with acute glomerulonephritis. What are the most likely pathological changes in the urine formula?

- A. Proteinuria
- B. Cylindruria
- C. Presence of fresh erythrocytes
- D. Pyuria
- E. Natriuria

41. As a result of continuous starvation the glomerular filtration rate has increased by 20%. The most probable cause of the glomerular filtration alteration under the mentioned conditions is:

- A. Decrease in the oncotic pressure of blood plasma
- B. Increase in the systemic arterial pressure
- C. Increase in the permeability of the renal filter
- D. Increase of the filtartion quotient
- E. Increase of the renal blood flow

42. Sinoatrial block with android-type obesity had been suffering from arterial hypertension, hyperglycemia, glycosuria for a long time and died from the cerebral haemorrhage. Pathologic

examination revealed pituitary basophil adenoma, adrenal cortex hyperplasia. What is the most likely diagnosis?

- A. Itsenko-Cushing's syndrome
- B. Diabetes mellitus
- C. Acromegalia
- D. Pituitary nanism
- E. Adiposogenital dystrophy

43. A patient presents with icteritiousness of skin, scleras and mucous membranes. Blood plasma the total bilirubin is increased, stercobilin is increased in feces, urobilin is increased in urine. What type of jaundice is it?

- A. Haemolytic
- B. Gilbert's disease
- C. Parenchymatous
- D. Obturational
- E. Cholestatic

44. As a result of a trauma a patient has developed traumatic shock that led to the following disorders: AP is 140/90 mm Hg, Ps is 120 bpm. The patient is fussy, talkative, pale. Such state relates to the following shock phase:

- A. Erectile
- B. Latent period
- C. Terminal
- D. Torpid
- E. –

45. A patient with massive burns developed acute renal insufficiency characterized by a significant and rapid deceleration of glomerular filtration. What is the mechanism of its development?

- A. Reduction of renal blood flow
- B. Damage of glomerular filter
- C. Reduction of functioning nephron number
- D. Rise of pressure of tubular fluid
- E. Renal artery embolism

46. A 46 year old woman suffering from chololithiasis developed jaundice. Her urine became dark-yellow and feces became colourless. Blood serum will have the highest concentration of the following substance:

- A. Conjugated bilirubin
- B. Unconjugated bilirubin
- C. Biliverdin
- D. Mesobilirubin
- E. Urobilinogen

47. A 30 year old woman has face edemata. Examination revealed proteinuria (5,87 g/l), hypoproteinemia, dysproteinemia, hyperlipidemia. What condition is the set of these symptoms typical for?

- A. Nephrotic syndrome
- B. Nephritic syndrome
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- A. Reduced tubular reabsorption of water
 - B. Reduced tubular reabsorption of Na ions
 - C. Reduced tubular reabsorption of protein
 - D. Reduced glucose reabsorption
 - E. Acceleration of glomerular filtration
49. Examination of a 42 year old patient revealed a tumour of adenohypophysis. Objectively: the patient's weight is 117 kg, he has moon-like hyperemic face, redblue striae of skin distension on his belly. Osteoporosis and muscle dystrophy are present. AP is 210/140 mm Hg. What is the most probable diagnosis?
- A. Cushing's disease
 - B. Cushing's syndrome
 - C. Conn's disease
 - D. Diabetes mellitus
 - E. Essential hypertension
50. A 46-year-old patient suffering from the diffuse toxic goiter underwent resection of the thyroid gland. After the surgery the patient presents with appetite loss, dyspepsia, increased neuromuscular excitement. The body weight remained unchanged. Body temperature is normal. Which of the following has caused such a condition in this patient?
- A. Reduced production of parathormone
 - B. Increased production of thyroxin
 - C. Increased production of calcitonin
 - D. Increased production of thyroliberin
 - E. Reduced production of thyroxin
51. A doctor recommends a patient with duodenal ulcer to drink cabbage and potato juice after the therapy course. Which substances contained in these vegetables help to heal and prevent the ulcers?
- A. Vitamin U
 - B. Pantothenic acid
 - C. Vitamin C
 - D. Vitamin B1
 - E. Vitamin K
52. A 30-year-old male patient with acute pancreatitis has been found to have a disorder of cavitary protein digestion. The reason for such condition can be the hyposynthesis and hyposecretion of the following enzyme:
- A. Tripsin
 - B. Pepsin
 - C. Lipase
 - D. Dipeptidase
 - E. Amylase
53. A coprological survey revealed lightcolored feces containing drops of neutral fat. The most likely reason for this condition is the disorder of:
- A. Bile inflow into the bowel
 - B. Gastric juice acidity
 - C. Pancreatic juice secretion
 - D. Intestinal juice secretion
 - E. Intestinal absorption

54. As a result of continuous starvation the glomerular filtration rate has increased by 20%. The most probable cause of the glomerular filtration alteration under the mentioned conditions is:
- A. Decrease in the oncotic pressure of blood plasma
 - B. Increase in the systemic arterial pressure
 - C. Increase in the permeability of the renal filter
 - D. Increase of the filtration quotient
 - E. Increase of the renal blood flow
55. Jaundice treatment involves administration of barbiturates inducing the synthesis of UDP-glucuronyl transferase. A medicinal effect is caused by the production of:
- A. Direct reacting (conjugated) bilirubin
 - B. Indirect reacting (unconjugated) bilirubin
 - C. Biliverdin
 - D. Protoporphyrin
 - E. Heme
56. Blood analysis of a patient with jaundice reveals conjugated bilirubinemia, increased concentration of bile acids. There is no stercobilinogen in urine. What type of jaundice is it?
- A. Obstructive jaundice
 - B. Hepatocellular jaundice
 - C. Parenchymatous jaundice
 - D. Hemolytic jaundice
 - E. Cythemolytic jaundice
57. The patient with complaints of permanent thirst applied to the doctor. Hyperglycemia, polyuria and increased concentration of 17-ketosteroids in the urine were revealed. What disease is the most likely?
- A. Steroid diabetes
 - B. Insulin-dependent diabetes mellitus
 - C. Myxoedema
 - D. Type I glycogenosis
 - E. Addison's disease
58. A patient complains of hydruria (7 liters per day) and polydipsia. Examination reveals no disorders of carbohydrate metabolism. These abnormalities might be caused by the dysfunction of the following endocrine gland:
- A. Neurohypophysis
 - B. Adenohypophysis
 - C. Islets of Langerhans (pancreatic islets)
 - D. Adrenal cortex
 - E. Adrenal medulla
59. A patient presents with icteritiousness of skin, scleras and mucous membranes. Blood plasma the total bilirubin is increased, stercobilin is increased in feces, urobilin is increased in urine. What type of jaundice is it?
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 - E. Cholestatic

60. A patient with massive burns developed acute renal insufficiency characterized by a significant and rapid deceleration of glomerular filtration. What is the mechanism of its development?
- A. Reduction of renal blood flow
 - B. Damage of glomerular filter
 - C. Reduction of functioning nephron number
 - D. Rise of pressure of tubular fluid
 - E. Renal artery embolism
61. A patient has been diagnosed with influenza. His condition became drastically worse after taking antipyretic drugs. His consciousness is confused, AP is 80/50 mm Hg, Ps is 140/m, body temperature dropped down to 35,8°C. What complication developed in this patient?
- A. Collapse
 - B. Hyperthermia
 - C. Hypovolemia
 - D. Acidosis
 - E. Alkalosis
62. A child has an acute renal failure. What biochemical factor found in saliva can confirm this diagnosis?
- A. Increase in urea concentration
 - B. Increase in glucose concentration
 - C. Decrease in glucose concentration
 - D. Increase in concentration of higher fatty acids
 - E. Decrease in nucleic acid concentration
63. After severe viral hepatitis a 4 year old boy presents with vomiting, occasional loss of consciousness, convulsions. Blood test revealed hyperammonemia. Such condition is caused by a disorder of the following biochemical hepatic process:
- A. Disorder of ammonia neutralization
 - B. Disorder of biogenic amines neutralization
 - C. Protein synthesis inhibition
 - D. Activation of amino acid decarboxylation
 - E. Inhibition of transamination enzymes
64. A patient with a history of chronic glomerulonephritis presents with azotemia, oliguria, hypo- and isosthenuria, proteinuria. What is the leading factor in the pathogenesis of these symptoms development under chronic renal failure?
- A. Mass decrease of active nephrons
 - B. Intensification of glomerular filtration
 - C. Tubular hyosecretion
 - D. Disturbed permeability of glomerular membranes
 - E. Intensification of sodium reabsorption
65. After the traumatic tooth extraction a patient is complaining of acute, dull, poorly-localized pain in gingiva, body temperature rise up to 37,5°C. The patient has been diagnosed with alveolitis. Specify the kind of pain in this patient:
- A. Protopathic
 - B. Epicritic
 - C. Visceral
 - D. Heterotopic
 - E. Phantom

66. Blood analysis of a patient with jaundice reveals conjugated bilirubinemia, increased concentration of bile acids. There is no stercobilinogen in urine. What type of jaundice is it?
- A. Obstructive jaundice
 - B. Hepatocellular jaundice
 - C. Parenchymatous jaundice
 - D. Hemolytic jaundice
 - E. Cythemolytic jaundice
67. A 60 year old patient was found to have a dysfunction of main digestive enzyme of saliva. This causes the disturbance of primary hydrolysis of:
- A. Carbohydrates
 - B. Fats
 - C. Proteins
 - D. Cellulose
 - E. Lactose
68. Examination of a 42 year old patient revealed a tumor of adenohypophysis. Objectively: the patient's weight is 117 kg, he has moon-like hyperemic face, redblue striae of skin distension on his belly. Osteoporosis and muscle dystrophy are present. AP is 210/140 mm Hg. What is the most probable diagnosis?
- A. Cushing's disease
 - B. Cushing's syndrome
 - C. Conn's disease
 - D. Diabetes mellitus
 - E. Essential hypertension
69. Toxic affection of liver results in dysfunction of protein synthesis. It is usually accompanied by the following kind of dysproteinemia:
- A. Absolute hypoproteinemia
 - B. Relative hypoproteinemia
 - C. Absolute hyperproteinemia
 - D. Relative hyperproteinemia
 - E. Paraproteinemia
70. A patient with jaundice has high total bilirubin that is mainly indirect (unconjugated), high concentration of stercobilin in the stool and urine. The level of direct (conjugated) bilirubin in the blood plasma is normal. What kind of jaundice can you think of?
- A. Hemolytic
 - B. Parenchymal (hepatic)
 - C. Mechanical
 - D. Neonatal jaundice
 - E. Gilbert's disease
71. 14 days after quinsy a 15-year-old child presented with morning facial swelling, high blood pressure, "meat slops" urine. Immunohistological study of a renal biopsy sample revealed deposition of immune complexes on the basement membranes of the capillaries and in the glomerular mesangium. What disease developed in the patient?
- A. Acute glomerulonephritis
 - B. Acute interstitial nephritis
 - C. Lipoid nephrosis
 - D. Acute pyelonephritis
 - E. Necrotizing nephrosis

72. An unconscious patient was taken by ambulance to the hospital. On objective examination the patient was found to have no reflexes, periodical convulsions, irregular breathing. After laboratory examination the patient was diagnosed with hepatic coma. Disorders of the central nervous system develop due to the accumulation of the following metabolite:

- A. Ammonia
- B. Urea
- C. Glutamine
- D. Bilirubin
- E. Histamine

73. A 19-year-old male was found to have an elevated level of potassium in the secondary urine. These changes might have been caused by the increase in the following hormone level:

- A. Aldosterone
- B. Oxytocin
- C. Adrenaline
- D. Glucagon
- E. Testosterone

74. Due to the use of poor-quality measles vaccine for preventive vaccination, a 1-year-old child developed an autoimmune renal injury. The urine was found to contain macromolecular proteins. What process of urine formation was disturbed?

- A. Filtration
- B. Reabsorption
- C. Secretion
- D. Reabsorption and secretion
- E. Secretion and filtration

75. Due to the blockage of the common bile duct (which was radiographically confirmed), the biliary flow to the duodenum was stopped. We should expect the impairment of:

- A. Fat emulsification
- B. Protein absorption
- C. Carbohydrate hydrolysis
- D. Secretion of hydrochloric acid
- E. Salivation inhibition

76. A drycleaner's worker has been found to have hepatic steatosis. This pathology can be caused by the disruption of synthesis of the following substance:

- A. Phosphatidylcholine
- B. Tristearin
- C. Urea
- D. Phosphatidic acid
- E. Cholic acid

77. A 41-year-old male patient has a history of recurrent attacks of heartbeats (paroxysms), profuse sweating, headaches. Examination revealed hypertension, hyperglycemia, increased basal metabolic rate, and tachycardia. These clinical presentations are typical for the following adrenal pathology:

- A. Hyperfunction of the medulla
- B. Hypofunction of the medulla
- C. Hyperfunction of the adrenal cortex
- D. Hypofunction of the adrenal cortex
- E. Primary aldosteronism

78. 40-year-old female patient has undergone thyroidectomy. Histological study of thyroid gland found the follicles to be of different size and contain foamy colloid, follicle epithelium is high and forms papillae, there is focal lymphocytic infiltration in stroma. Diagnose the thyroid gland disease:
- A. Basedow's disease
 - B. Hashimoto's thyroiditis
 - C. Riedel's thyroiditis
 - D. De Quervain's disease
 - E. Nodular goiter
79. Urine analysis has shown high levels of protein and erythrocytes in urine. This can be caused by the following:
- A. Renal filter permeability
 - B. Effective filter pressure
 - C. Hydrostatic blood pressure in glomerular capillaries
 - D. Hydrostatic primary urine pressure in capsule
 - E. Oncotic pressure of blood plasma
80. A patient complaining of pain in the left shoulder-blade region has been diagnosed with myocardial infarction. What kind of pain does the patient have?
- A. Radiating
 - B. Visceral
 - C. Phantom
 - D. Protopathic
 - E. Epicritic
81. A patient has a critical impairment of protein, fat and hydrocarbon digestion. Most likely it has been caused by low secretion of the following digestive juice:
- A. Pancreatic juice
 - B. Saliva
 - C. Gastric juice
 - D. Bile
 - E. Intestinal juice
82. A 49-year-old male patient with acute pancreatitis was likely to develop pancreatic necrosis, while active pancreatic proteases were absorbed into the blood stream and tissue proteins broke up. What protective factors of the body can inhibit these processes?
- A. α 2-macroglobulin, α 1-antitrypsin
 - B. Immunoglobulin
 - C. Cryoglobulin, interferon
 - D. Ceruloplasmin, transferrin
 - E. Hemopexin, haptoglobin
83. A 16-year-old female patient has fainted after quickly changing her body position from horizontal to vertical one. Which process from the ones listed below has caused the loss of consciousness in the first place?
- A. Decreasing venous return
 - B. Increasing venous return
 - C. Increasing central venous pressure
 - D. Decreasing oncotic pressure of blood plasma
 - E. Increasing arterial pressure

84. According to the results of glucose tolerance test, the patient has no disorder of carbohydrate tolerance. Despite that, glucose is detected in the patients's urine (5 mmol/l). The patient has been diagnosed with renal diabetes. What renal changes cause glucosuria in this case?

- A. Decreased activity of glucose reabsorption enzymes
- B. Increased activity of glucose reabsorption enzymes
- C. Exceeded glucose reabsorption threshold
- D. Increased glucose secretion
- E. Increased glucose filtration

85. Due to the use of poor-quality measles vaccine for preventive vaccination, a 1-year-old child has developed an autoimmune renal injury. The urine was found to contain macromolecular proteins. What process of urine formation has been disturbed?

- A. Filtration
- B. Reabsorption
- C. Secretion
- D. Reabsorption and secretion
- E. Secretion and filtration

86. A 16-year-old adolescent is diagnosed with hereditary UDP (uridine diphosphate) glucuronyltransferase deficiency. Laboratory tests revealed hyperbilirubinemia caused mostly by increased blood content of the following substance:

- A. Unconjugated bilirubin
- B. Conjugated bilirubin
- C. Urobilinogen
- D. Stercobilinogen
- E. Biliverdine

87. Poisoning caused by mercury (II) chloride (corrosive sublimate) occurred in the result of safety rules violation. In 2 days the patient's diurnal diuresis became 620 ml. The patient developed headache, vomiting, convulsions, dyspnea; moist crackles are observed in the lungs. Name this pathology:

- A. Acute renal failure
- B. Chronic renal failure
- C. Uremic coma
- D. Glomerulonephritis
- E. Pyelonephritis

88. A patient has been diagnosed with influenza. His condition drastically worsened after taking antipyretic drugs. He is unconscious, AP is 80/50 mm Hg, Ps is 140/m, body temperature dropped down to 35,8°C. What complication developed in this patient?

- A. Collapse
- B. Hyperthermia
- C. Hypovolemia
- D. Acidosis
- E. Alkalosis

89. After a road accident a victim has tachycardia, arterial blood pressure 110/70 mm Hg, tachypnoe, the skin is pale and dry, excitation of central nervous system is observed. What shock stage is the patient most likely in?

- A. Erectile
- B. Terminal
- C. Torpid

- D. Preshock (compensation stage)
- E. Agony

90. A 51-year-old patient suffers from acute pancreatitis with disrupted common bile duct patency. What condition can develop in this case?

- A. Mechanical jaundice
- B. Hemolytic jaundice
- C. Hepatocellular jaundice
- D. Hepatic coma
- E. Portal hypertension

91. A 50-year-old man, who has been suffering from chronic hepatic failure for several years, has developed ascites. What is the main mechanism of this disorder development?

- A. Increased pressure in portal vein system
- B. Decrease of albumin and globulin synthesis in liver
- C. Increased content of low-density and very low-density lipoproteins in blood
- D. Neurotoxins appearing in blood
- E. Increase of blood oncotic pressure

92. A 27-year-old patient with injury to the neck has lost approximately 30% of the blood volume. The patient's condition is severe: blood pressure is 60/40 mmHg, heart rate is 140/min, respiratory rate is 30/min, conscious. Characterize the condition of the patient's circulatory system:

- A. Hypovolemic shock
- B. Cardiogenic shock
- C. Collapse
- D. Coma
- E. Arterial hypertension

93. An infant born prematurely 2 days ago presents with yellow coloring of skin and mucosa. Such a condition in the infant is caused by temporary deficiency of the following enzyme:

- A. UDP-glucuronyl transferase
- B. Aminolevulinic synthase
- C. Heme oxygenase
- D. Heme synthetase
- E. Biliverdine reductase

94. A 16-year-old adolescent is diagnosed with hereditary UDP (uridine diphosphate) glucuronyltransferase deficiency. Laboratory tests revealed hyperbilirubinemia caused mostly by increased blood content of the following substance:

- A. Unconjugated bilirubin
- B. Conjugated bilirubin
- C. Urobilinogen
- D. Stercobilinogen
- E. Biliverdine

95. A patient with hypertension has developed headache, tinnitus, vomiting, high BP up to 220/160 mm Hg. On examination: facial asymmetry on the right, volitional mobility is absent, increased tendon reflexes and muscle tone of extremities on the right. What motor disorder of nervous system occurred in this case?

- A. Hemiplegia
- B. Paraplegia
- C. Tetraplegia

- D. Hyperkinesia
- E. Monoplegia

96. A 62-year-old patient has been hospitalized due to massive cerebral hemorrhage. Blood pressure is 70/30 mm Hg, heart rate is 120/min., respiratory rate is 4/min., unconscious, no response to external stimuli. Such condition can be determined as:

- A. Coma
- B. Shock
- C. Collapse
- D. Stress
- E. Agony