МИНИСТЕРСТВО ЗДРАВООХРАНЕНИЯ РЕСПУБЛИКИ БЕЛАРУСЬ

УЧРЕЖДЕНИЕ ОБРАЗОВАНИЯ
«ГОМЕЛЬСКИЙ ГОСУДАРСТВЕННЫЙ МЕДИЦИНСКИЙ УНИВЕРСИТЕТ»

Кафедра патологической физиологии

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ТЕСТОВЫЕ ЗАДАНИЯ ПО ПАТОЛОГИЧЕСКОЙ ФИЗИОЛОГИИ

Учебно-методическое пособие
для студентов 3 курса факультета по подготовке специалистов
для зарубежных стран, обучающихся на английском языке
по специальности «Лечебное дело», медицинских вузов

В трех частях

Часть 1
Общая патофизиология

TEST TASKS ON PATHOLOGICAL PHYSIOLOGY

Teaching workbook
for 3nd year students of the faculty for training specialists
for foreign countries, studying in English on specialty «General medicine»
of higher medical education institutions

In three parts

Part 1
General pathophysiology

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Учебно-методическое пособие содержит тестовые задания, составленные в соответствии с типовой учебной программой для вузов по специальности «Лечебное дело». Решение этих заданий позволит углубить и закрепить знания студентов при изучении патологической физиологии.

Предназначено для студентов 3 курса факультета по подготовке специалистов для зарубежных стран, обучающихся на английском языке по специальности «Лечебное дело» как в аудиторное, так и внеаудиторное время. Может быть использовано для самостоятельной работы и самоконтроля знаний.

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LIST OF ABBREVIATION

ABC — acid-base condition
ACTH — adrenocorticotropic hormone
ADH — antidiuretic hormone (vasopressin)
AIDS — acquired immune deficiency syndrome
ATP — adenosinetriphosphate
ATPase — adenosinetriphosphatase
BAS — biological active substances
BCG — vaccine of Calmette and Guerin — vaccine strain CalmetteGuerin bacillus
BE — excess of bases
C3b,C5a — complement components 3a, 5b
cAMP — cyclic adenosine monophosphate
CD — claster of differentiation
cGMP — cyclic guanine monophosphate
CNS — central nervous system
DNA — deoxyribonucleic acid
GABA — gamma-aminobutyric acid
HDL — high-density lipoprotein
HIV — human immunodeficient virus
HLA — human leucocyte antigens
Ig — immunoglobulin
IL — interleukins
LDL — low density lipoproteins
LP — lipoproteins
LPLase — lipoprotein lipase
mRNA — messenger ribonucleic acid
NAD — nicotinamide adenine dinucleotide
NADP — nicotinamide adenine dinucleotide phosphate
Pa O_2 — partial pressure of oxygen in the arterial blood
Pa CO_2 — partial pressure of carbon dioxide in the arterial blood
POL — peroxidation of lipids
Pv O_2 — partial pressure of oxygen in the venous blood
Pv CO_2 — partial pressure of carbon dioxide in the venous blood
pO_2 — partial pressure of oxygen
pCO_2 — partial pressure of carbon dioxide
RBC — red blood cell
RNA — ribonucleic acid
SB — standard bicarbonate
T_3 — triiodothyronine
T_4 — tetraiodothyronine, thyroxine
TNF — tumor necrosis factor
TPVR — total peripheral vascular resistance
UV — ultraviolet
VLDL — very low density lipoproteins

MULTIPLE CHOICE TESTS

INTRODUCTION TO THE DISCIPLINE "PATHOLOGICAL PHYSIOLOGY". GENERAL DOCTRINE ABOUT DISEASE. GENERAL ETIOLOGY AND PATHOGENESIS

Indicate all correct answers

1. A nosology includes the following sections:
Variants of answer:
a) doctrine about typical forms of organs and tissues pathology;
b) general pathogenesis;
c) doctrine about typical changes of organs and tissues in pathology;
d) general doctrine about disease;
e) general etiology;
f) doctrine about typical pathological processes.

2. Choose the most precise characterization of pathologic process:
Variants of answer:
a) a process that occurs in the body at constant action of pathogenic factors;
b) qualitatively unique combination of damage and protective-adaptive reactions;
c) combination of protective and adaptive reactions, the intensity of which exceeds the norm.

3. Specify examples of pathological processes:
Variants of answer:
a) residual limb;
b) atrophy of alveolar processes;
c) inflammation of the lung tissue in pneumonia;
d) oxygen deficiency in obliterating endarteritis;
e) inflammation of heart muscle after myocardial infarction.

4. Changes little persistent disorders in the structure and function of the organ (tissue) is called:
Variants of answer:
a) pathological reaction;
b) pathological process;
c) pathological condition;
d) disease.

5. Pathological reaction:
Variants of answer:
a) can occur in action of normal stimulus;
b) develops when only emergency stimulus;

c) biologically inadequate response of the organism;
d) peculiar form the organism's adaptation to living conditions.

6. Pathological reactions include:
Variants of answer:
a) allergy;
b) hypoxia;
c) trauma;
d) burn;
e) tumor;
f) pathological reflexes.

7. Typical pathological processes include:
Variants of answer:
a) hypoxia;
b) tumor growth;
c) atherosclerosis;
d) inflammation;
e) mucosa ulcer;
f) ischemia.

8. The term "predisease" – is:
Variants of answer:
a) period of vital activity of organism between the onset of the pathogenic factor action and the occurrence of the first signs of disease;
b) period of vital activity of organism from the first signs of the disease before the full development of its symptoms;
c) period of vital activity of organism, characterized by a sharp decline in its adaptive capacity, while maintaining a constant internal environment.

9. Etiological factor of the disease is:
Variants of answer:
a) factor influencing the severity and duration of disease;
b) factor determining the specific disease;
c) factor necessary for the development of disease;
d) factor that increases the incidence of disease.

10. Conditions of a disease occurrence is:
Variants of answer:
a) factors without which the disease does not occur;
b) factor influencing at frequency, severity and duration of disease;
c) factors preventing the disease occurrence;
d) factors promoting the disease occurrence.

11. Specific features of disease depends on:
Variants of answer:
a) causes of disease;

b) conditions contributing to the development of disease;
c) reactivity.

12. Specify the possible outcome of the disease:
Variants of answer:
a) complete recovery;
b) incomplete recovery;
c) relapse;
d) remission;
e) complication;
f) death.

13. The stable recovery mechanisms include:
Variants of answer:
a) reactive leukocytosis;
b) compensatory hypertrophy of organ;
c) neutralization of poisons by blood proteins;
d) reparative regeneration;
e) development of immunity.

14. Etiology is:
Variants of answer:
a) doctrine about the causes and conditions of disease occurrence;
b) doctrine about disease causes;
c) doctrine about set of conditions that cause the development of diseases.

15. Pathogenesis is:
Variants of answer:
a) doctrine about the mechanisms of origin, course and outcome of disease;
b) doctrine about the causes and conditions of disease;
specific mechanisms of the development of pathological processes;
c) doctrine about typical pathological processes;
d) doctrine about typical forms of pathology.

16. The primary link in the pathogenesis of disease is:
Variants of answer:
a) conditions of action of the damaging factor on the body;
b) initial damage leading to further pathological changes in the organism;
c) link of pathogenesis, which begins a vicious cycle;
d) primary stage of terminal conditions;
e) primary reaction of organism to the injury.

17. The main link in the pathogenesis of disease is:
Variants of answer:
a) primary damage of the body;

b) damage, entailing a vicious circle;
c) damage causes most of the disease symptoms;
d) causes and conditions of disease occurrence;
e) irreversible damages.

18. Specify the main link in pathogenesis of diabetes:
Variants of answer:
a) stress;
b) insufficient insulin production;
c) hyperglycemia when taking sugar;
d) blockage of bile duct by stone;
e) polyuria.

19. Vicious circle in the pathogenesis of diseases is:
Variants of answer:
a) transition of primarily occurred acute phase to chronic with periods of relapse and remission;
b) cyclic course of the disease, in which each new cycle differs from the previous by progressive increase in severity of disorders;
c) occurrence of positive feedback between the individual links of pathogenesis, contributing to progression of the disease;
d) exhaustion of compensatory mechanisms, leading to the deterioration of the condition.

20. Sanogenesis studies:
Variants of answer:
a) mechanisms of disease development;
b) conditions of diseases occurrence;
c) causes of diseases occurrence;
d) recovery mechanism;
e) pathological processes.

21. Common signs of clinical and biological death are:
Variants of answer:
a) bradycardia;
b) respiratory arrest;
c) cadaveric lividity;
d) disappearance of brain bioelectrical activity on the electroencephalogram.
e) cardiac arrest.

22. Rigor mortis is due to:
Variants of answer:
a) ATP reduction in myocytes;
b) potassium accumulation in myocytes;

c) violations of lysosomal enzymes;
d) calcium accumulation in myocytes;
e) violation of biological oxidation in myocytes.

23. Terminal conditions include:
Variants of answer:
a) pathological system;
b) terminal pause;
c) biological death;
d) preagony;
e) clinical death.

PATHOGENIC EFFECTS OF ENVIRONMENTAL FACTORS ON THE HUMAN BODY

Indicate all correct answers

1. Factors which play a major role in the pathogenesis of accelerations are:
Variants of answer:
a) vestibular disorders;
b) circulatory disorders;
c) respiratory disorders;
d) hypoxia.

2. How does change the blood pressure in the aortic arch in the longitudinal negative overload?
Variants of answer:
a) increases;
b) decreases;
c) not changes.

3. Typical symptoms resulting from the positive longitudinal overload in 56 g are:
Variants of answer:
a) gray blurred vision;
b) red blurred vision;
c) facial redness;
d) facial paleness;
e) loss of consciousness;
f) heaviness of limbs.

4. Changes occur in the body during prolonged stay in weightlessness are:
Variants of answer:
a) decrease in ADH production;

b) weight reduction;
c) decrease in vessels blood filling of head and neck;
d) increase in diuresis;
e) increased excretion of Ca^{2+} from the body;
f) decrease in O_2 consumption in tissues.

5. Name the main mechanisms of cell damage under excessive action of UV rays:

Variants of answer:
a) energy deficit;
b) activation of phospholipase;
c) hydrolysis of secondary messengers;
d) activation of complement system;
e) intensification of lipid peroxidation;
f) violation of cells genetic apparatus.

6. Specific damaging effects of ultrasound on cells is:

Variants of answer:
a) violation of DNA replication, transcription and translation;
b) protein denaturation;
c) cavitation;
d) inhibition of cellular enzymes;
e) formation of free radicals.

7. The main etiological factor of acute mountain (altitude) sickness is:

Variants of answer:
a) decrease in barometric pressure;
b) decrease in O_2 partial pressure in the air;
c) ultraviolet radiation;
d) low temperature.

8. Compensation stage of acute mountain sickness is characterized by:

Variants of answer:
a) increase in heart rate;
b) pulmonary hyperventilation;
c) pulmonary hypoventilation;
d) increasing the number of RBCs in blood;
e) increase in erythropoietin production by the kidneys;
f) decrease in blood pressure.

9. Mechanisms of compensation in acute mountain sickness are:

Variants of answer:
a) redistribution of blood;
b) erythrocytosis;
c) intensification of glycolysis;

d) increase in pulmonary ventilation;
e) reduction of cells membrane potential;
f) tachycardia.

10. Decompensation stage of acute mountain sickness is characterized by:
Variants of answer:
a) Cheyne-Stokes or Biot types of respiration;
b) increase in blood pH;
c) increase in the excitability of respiratory center;
d) euphoria;
e) depression.

11. Specify the conditions that increase the pathogenic effect of electric current on the body:
Variants of answer:
a) emotional readiness for the current effects;
b) moist skin;
c) overfatigue;
d) strong alcoholic intoxication;
e) overheating;
f) overcooling.

12. Specify the conditions conducive to the overheating of the body:
Variants of answer:
a) high humidity at high ambient temperatures;
b) increased sweating;
c) uncoupling oxidation and phosphorylation;
d) peripheral vasodilatation;
e) peripheral vasoconstriction;
f) water deficit in the body.

13. What are the options for changing the heat production and heat elimination underlie the development of hyperthermia?
Variants of answer:
a) reduction of heat production at normal heat elimination;
b) reduction of heat production at high heat elimination;
c) normal heat production at low heat elimination;
d) normal heat production at high heat elimination;
e) increase of heat production at low heat elimination;
f) increase of heat production at normal heat elimination.

14. At increase of body temperature in exogenous hyperthermia underlie the following mechanisms:
Variants of answer:
a) active reorganization of thermoregulation activity, aimed at increasing of heat production;

b) heat storage in the body background the maximum exertion of heat elimination mechanisms due to their relative deficiency;

c) prevalence of primary stimulated by hormones (T_3, T_4, catecholamines) of heat production over the heat elimination;

d) blockade of the physical mechanisms of heat elimination (thermal radiation, heat conducting, evaporation) by environmental conditions.

15. At the decompensation stage (excitation period) of exogenous overheating, heat production is:

Variants of answer:

a) increase;

b) decrease;

c) initial decrease with subsequent increase;

d) not changes.

16. Endogenous overheating is the result:

Variants of answer:

a) increase of heat production as a result of changes in the activity thermoregulation center;

b) reducing of heat elimination due to blockade of physical mechanisms of thermoregulation;

c) increase of heat production due to the increased secretion of T3, T4 hormones, catecholamines;

d) increased formation of endopyrogen in the body;

e) poisoning by substances able to uncouple oxidation and phosphorylation (alphadinitrophenol).

17. Specify the reaction of organism arising at hypothermia in a phase compensation:

Variants of answer:

a) peripheral vasoconstriction;

b) peripheral vasodilatation;

c) decrease in metabolic rate;

d) increase in glycogenolysis in liver and muscles;

e) increased sweating;

f) muscular tremor (chills).

18. Breaking of thermoregulatory responses during deep hypothermia is observed due to inhibition:

Variants of answer:

a) cerebral cortex;

b) extrapyramidal centers;

c) limbic structures;

d) hypothalamus;

e) thalamus.

19. Identify the factors that lead to the malfunction of heart in burn disease:
Variants of answer:
a) decrease in mass of circulating blood;
b) hemoconcentration;
c) hyperkalemia;
d) hypokalemia;
e) increase in mass of circulating blood.

20. Identify cells, tissues and organs are radiosensitive:
Variants of answer:
a) brain (nerve cells);
b) bone marrow;
c) muscular tissue;
d) sprout layer of skin and mucous membranes;
e) ovaries and testes;
f) erythrocytes;
g) thymus.

21. Specific manifestations of radiation cell damage are:
Variants of answer:
a) activation of lysosomal enzymes;
b) water radiolysis;
c) violation of electrolytes distribution;
d) DNA breaks;
e) acidosis.

22. List DNA damage of cells most likely under irradiation at dose 0.2 Gy:
Variants of answer:
a) damage of bases in DNA strands;
b) single-strand DNA breaks;
c) double-strand DNA breaks;
d) DNA crosslinks.

23. In which cases increases the sensitivity of organ (tissue) to ionizing radiation:
Variants of answer:
a) during hypoxia;
b) at vitamin E deficiency;
c) at tissue regeneration;
d) in presence of cytotoxic drugs;
e) in excess of superoxide dismutase;
f) in excess of oxygen;
g) during hyperthermia.

24. In what forms of acute radiation sickness observed 100 % lethal outcome?

Variants of answer:

a) cerebral;

b) gastrointestinal;

c) bone marrow;

d) toxemic.

25. Under the influence of ionizing radiation to cell, the main target in it is:

Variants of answer:

a) cytoplasmic membrane;

b) DNA;

c) sarcoplasmic reticulum;

d) ribosomes;

e) mitochondria.

THE ROLE OF HEREDITY IN PATHOLOGY

Indicate all correct answers

1. Mutagen is called:

Variants of answer:

a) substances that can cause a state of heightened sensitivity in humans;

b) factors that can cause changes in the genetic structure of a biological object, which are then transmitted by inheritance.

2. Mutagenic effect of high temperatures on a biological object is associated with:

Variants of answer:

a) capture of photon by cell genome;

b) cavitation in a cell;

c) increase in mobility of molecules and atoms in the gene;

d) appearance of radiotoxins in a cell;

e) ionization of atoms and molecules.

3. Specify agents capable of causing mutations in the genes:

Variants of answer:

a) endogenic hydrogen peroxide;

b) free radical;

c) oncoprotein;

d) denatured protein;

e) urea;

f) formaldehyde.

4. Phenocopies is called:

Variants of answer:

a) disease resembling by current with hereditary;

b) similar with current hereditary diseases caused by injuries of different genes;

c) changes in genotype;

d) changes in genome;

e) all gametopathies.

5. Chromosomal disease is resulted in:

Variants of answer:

a) gene mutations;

b) chromosome mutations;

c) genomic mutations;

d) fetopathy.

6. Chromosomal mutation may be associated with:

Variants of answer:

a) mutagen exposure;

b) loss of region of single chromosome;

c) increase or decrease in the number of chromosomes;

d) transfer of section from one chromosome to another;

e) substitution of single nucleotide DNA by other.

7. Specify the mechanisms for the implementation of pathogenic genes in the adult:

Variants of answer:

a) termination of structural protein synthesis;

b) termination of enzyme synthesis;

c) termination of mRNA synthesis;

d) synthesis of pathological protein;

e) synthesis of fetoprotein;

f) gene translocation.

8. Which of the following assertions are true:

Variants of answer:

a) gene, which determines dominant pathology often may be present in genotype of phenotypically healthy humans;

b) gene, which determines recessive pathology often may be present in genotype of phenotypically healthy humans;

c) recessive pathology can be not shown in a number generations;

d) dominant pathology can be not shown in a number generations.

9. Hereditary nature of disease is indicated:

Variants of answer:

a) high concordance of disease in fraternal twins living in same conditions;

b) high concordance of disease in monozygotic twins living in sharply contrasting different conditions;

c) low concordance of disease in monozygotic twins living in different conditions.

10. Specify signs of hereditary diseases:

Variants of answer:

a) manifested in the genealogy of at least 2 generations;

b) does not manifested in genealogy of the patient;

c) can be inherited from parents sick to offspring;

d) there are anomalies in genotype of patient;

e) no anomaly in the genotype, but the mechanism of transmission of hereditary information is broken.

11. Diseases with hereditary predisposition are:

Variants of answer:

a) atherosclerosis;

b) achondroplasia;

c) myopia;

d) hemophilia A;

e) diabetes mellitus;

f) atopic bronchial asthma.

12. Indicate which of the following diseases are chromosome:

Variants of answer:

a) hemophilia;

b) phenylketonuria;

c) Down syndrome;

d) Huntington chorea;

e) Klinefelter syndrome;

f) sickle cell anemia;

g) Alzheimer disease.

13. Indicate which of the following diseases are congenital:

Variants of answer:

a) neonatal syphilis;

b) phenylketonuria;

c) AIDS in newborn;

d) achondroplasia;

e) polydactyly.

14. Monogenic diseases are:

Variants of answer:

a) diabetes mellitus;

b) atherosclerosis;
c) hemochromatosis;
d) glycogen storage disease;
e) pulmonary arterial hypertension;
f) hemophilia B.

15. Primary hypertension refers to a group:
Variants of answer:
a) chromosomal diseases;
b) multifactorial diseases (polygenic);
c) diseases in which occurrence the exceptional role plays environmental factors;
d) congenital diseases;
e) monogenic diseases.

16. Phenylketonuria is caused by:
Variants of answer:
a) gene mutations;
b) chromosomal mutations;
c) genomic mutations;
d) mutation of sex chromosomes;
e) mutations in DNA repair genes.

17. Select a karyotypes, characteristic of Klinefelter syndrome:
Variants of answer:
a) 22 pair of autosomes + X0;
b) 22 pair of autosomes + XX;
c) 22 pair of autosomes + XXX;
d) 22 pair of autosomes + XXY;
e) 23 pair of autosomes + Y0;
f) 22 pair of autosomes + XXXY.

18. Which set of sex chromosomes is characteristic of Turner syndrome:
Variants of answer:
a) УО;
b) ХО;
c) ХУ;
d) ХХ;
e) ХХХ;
f) ХХУ.

19. Specify syndromes developing in violation of sex chromosomes disjunction:
Variants of answer:
a) Down syndrome;

b) Klinefelter syndrome;
c) Turner syndrome;
d) Marfan syndrome;
e) hemophilia A;
f) Y0 syndrome.

20. Specify conditions witch characterized by the presence of Barr bodies:
Variants of answer:
a) norm in men;
b) Klinefelter syndrome;
c) Turner syndrome;
d) norm in women.

21. Hereditary sexlinked diseases are:
Variants of answer:
a) polydactyly;
b) hemophilia;
c) daltonism;
d) albinism;
e) Down syndrome;
f) phenylketonuria.

22. Specify karyotype for Down syndrome:
Variants of answer:
a) 22 pair of autosomes + X0;
b) 22 pair of autosomes + XXY;
c) trisomy of 21 autosome;
d) 22 pair of autosomes + XXX.

23. Down syndrome is characterized by:
Variants of answer:
a) muscular hypotonia;
b) decrease of immunity;
c) increase in brain size;
d) "simian crease" in palm;
e) increased tendency to leukemia;
f) decreased amount of purines.

24. Manifestations of phenylketonuria are:
Variants of answer:
a) mental retardation;
b) seizures;
c) microcephaly;
d) deformed ears;

e) "simian crease" in palm;
f) slight skin pigmentation.

25. Blastopathy is characterized by following features:
Variants of answer:
a) occurs in the first 15 days from zygote formation;
b) can occur as a result of teratogens in the period from 16 to 56 days from zygote formation;
c) is a result of teratogens actions;
d) occurs during the intrauterine period.

THE ROLE OF REACTIVITY, CONSTITUTION AND AGE IN THE DEVELOPMENT OF PATHOLOGY

Indicate all correct answers

1. Which statements are true:
Variants of answer:
a) reactivity depends on the body constitution;
b) reactivity depends on the condition of nervous and endocrine systems;
c) reactivity does not depend on environmental factors;
d) reactivity and resistance of body does not depend on the state of metabolism;
e) reactivity depends on the age and sex.

2. Which statements are true:
Variants of answer:
a) high reactivity is always accompanied by a high resistance;
b) high reactivity may be accompanied by a low resistance;
c) low reactivity is always accompanied by a low resistance;
d) low reactivity may be accompanied by a high resistance.

3. Passive resistance is provided by:
Variants of answer:
a) blood-brain barrier;
b) mucosas;
c) skin;
d) vaccination;
e) injection of serum;
f) HCl content in gastric juice.

4. At positive hypergia:
Variants of answer:
a) external manifestations of reaction are reduced;

b) external manifestations of reaction are strengthened;
c) due to development of active defence reactions;
d) as a result of immunodeficiency.

5. Active resistance is provided by:
Variants of answer:
a) blood-brain barrier;
b) immune system;
c) skin, mucouses;
d) vaccination;
e) injection of serum.

6. Manifestations of active resistance include:
Variants of answer:
a) emigration of leukocytes and phagocytes;
b) neutralization and emission of toxins;
c) hereditary antimicrobial immunity;
d) acute phase response;
e) barrier function of skin and mucosas;
f) immunity after infectious diseases.

7. Insensitivity of human to dogs plague explains:
Variants of answer:
a) group reactivity;
b) individual specific reactivity;
c) group adaptation;
d) species resistance.

8. Perversion of reactivity termed:
Variants of answer:
a) hyperergia;
b) dysergia;
c) paraergia;
d) hypergia;
e) stress.

9. Features of reactivity in early childhood is determined by:
Variants of answer:
a) imperfection of functional and morphological development of nervous system;
b) immaturity of endocrine systems;
c) incomplete development of immune system;
d) imperfection of external and internal barriers;
e) features of metabolism;
f) predominance of active resistance over the passive.

10. Features of reactivity in old age is determined by:

Variants of answer:

a) irreversible regressive changes in the structure and function at all levels: molecular, cellular, organ, organism;

b) changing intensity and disorders of metabolism;

c) predominance of active resistance over the passive;

d) immaturity of endocrine systems.

11. Women are more resistant than men to:

Variants of answer:

a) starvation;

b) acute blood loss;

c) hypoxia;

d) low temperature;

e) effects of drugs.

12. Specify which constitution types corresponding to the classification by A. A. Bogomolets:

Variants of answer:

a) asthenic;

b) fibrotic;

c) normosthenic;

d) lipomatous;

e) hypersthenic;

f) pastous.

13. Specify which constitution types corresponding to the classification by M. V. Chernorutskii:

Variants of answer:

a) asthenic;

b) pyknic;

c) hypersthenic;

d) normosthenic;

e) athletic.

14. Asthenic type of constitution is characterized by:

Variants of answer:

a) tall;

b) broad chest;

c) horizontal position of heart;

d) acute epigastric angle;

e) high level of basal metabolism;

f) tendency to hypoglycaemia.

15. Specify which diseases predispose asthenic type of constitution by M. V. Chernorutskii:

Variants of answer:

a) gastric ulcer and duodenal ulcer;
b) Addison's disease;
c) diabetes mellitus;
d) cholelithiasis;
e) hernia of abdominal wall;
f) tendency to increase blood pressure.

16. Specify features characteristic of hypersthenic constitution types by M. V. Chernorutskii:

Variants of answer:

a) tall;
b) narrow chest;
c) very pronounced muscular and subcutaneous layer;
d) acute epigastric angle;
e) high level of basal metabolism;
f) tendency to obesity;
g) tendency to hypoglycaemia;
h) tendency to increase blood pressure.

17. Specify which diseases predispose hypersthenic type of constitution:

Variants of answer:

a) gastric ulcer and duodenal ulcer;
b) Addison's disease;
c) diabetes mellitus;
d) cholelithiasis;
e) hypertension.

18. Specify which constitution types corresponding to the classification by Sigaud:

Variants of answer:

a) respiratory;
b) asthenic;
c) digestive;
d) pyknic;
e) athletic;
f) muscular;
g) cerebral.

19. Specify which constitution types corresponding to the classification by Kretschmer:

Variants of answer:

a) asthenic;

b) normosthenic;
c) athletic;
d) hypersthenic;
e) pyknic.

CELL DAMAGE

Indicate all correct answers

1. Specify mechanisms of cell damage:
Variants of answer:
a) increasing contingency of oxidative phosphorylation;
b) increasing activity of enzymes of the DNA repair system;
c) intensification of free radical lipid peroxidation;
d) releasing of lysosomal enzymes in hyaloplasm;
e) expression of an oncogene.

2. Specify "nonspecific" manifestations of cell damage:
Variants of answer:
a) activation of lysosomal enzymes;
b) acidosis;
c) alkalosis;
d) labilization of lysosomal membranes;
e) uncoupling oxidation and phosphorylation;
f) inactivation of membrane bound enzymes;
g) hemolysis.

3. In case of damage in a cell observed:
Variants of answer:
a) acidosis;
b) alkalosis;
c) increasing the potassium ions concentration;
d) increasing the sodium ions concentration;
e) increasing the calcium ions concentration.

4. Which of the following changes in cell metabolism are accompanied by rapidly developing damage of the cytoplasmic membrane?
Variants of answer:
a) activation of glycolysis;
b) activation of phospholipase A_2;
c) inhibition of protein synthesis;
d) intensification of lipid peroxidation;

e) activation of adenylate cyclase;f) activation of guanylate cyclase.

5. What effects on the cell membranes have amphiphilic compounds in high concentrations?

Variants of answer:

a) reduction of cells membrane permeability;
b) increase of cells membrane permeability;
c) aggregate into micelles and incorporated into the membrane;
d) in form of monomers incorporated into the hydrophobic membrane layer;
e) destroy the lipid bilayer of the cell membrane.

6. The bases of increased ion permeability of the cytoplasmic membrane are:

Variants of answer:

a) lipid peroxidation;
b) hyperactivation of antioxidant enzymes;
c) electric breakdown;
d) mechanical stretching at cells swelling;
e) increase in the lipid bilayer microviscosity.

7. Specify mechanisms of cell membrane damage:

Variants of answer:

a) intensification of free radical and lipoperoxide reactions;
b) releasing of lysosomal hydrolase in hyaloplasm;
c) activation of membrane and intracellular phospholipase;
d) activation of glucose transport into the cell;
e) osmotic hyperhydration of cells and subcellular structures;
f) adsorption of proteins on cell membrane.

8. What are consequences of activation of lipid peroxidation of cell membranes:

Variants of answer:

a) decrease in hydrophobicity of lipids;
b) reducing ions permeability of mitochondrial membrane;
c) increase in content of polyunsaturated fatty acids in cytoplasmic membrane;
d) change in conformation of receptor protein;
e) increase in intracellular calcium ions;
f) violation in structural integrity of cytoplasmic membrane.

9. The direct consequences of reducing pH in cell damage are:

Variants of answer:

a) inactivation of lysosomal protease;
b) activation of lysosomal proteases and phospholipases;
c) decrease in DNA synthesis;
d) increase in permeability of lysosomal membrane;
e) activation of glycolysis;

f) change in conformational properties of membrane proteins;
g) activation of Na^+/K^+ -ATPase.

10. The development of edema at cell damage is contributed:
Variants of answer:
a) increasing the intracellular sodium ions concentration;
b) increasing the intracellular potassium ions concentration;
c) increase in permeability of cytoplasmic membrane for ions;
d) inhibition of anaerobic glycolysis;
e) reduction of cytoplasm hydrophilicity.

11. The increase of free ionized calcium in a cell is accompanied by:
Variants of answer:
a) activation of phospholipase;
b) inactivation of phospholipase C;
c) activation of lipid peroxidation;
d) cytoplasmic membrane hyperpolarization;
e) increase in free calmodulin;
f) increase in K^+ output from cell;
g) cell hyperhydration.

12. Cell damage may be due to changes in its genetic program at:
Variants of answer:
a) expression of pathogenic genes;
b) repression of normal genes;
c) gene translocation;
d) change in genes structure;
e) expression of genes of major histocompatibility complex.

13. Passive swelling of mitochondria is due:
Variants of answer:
a) work of electron transport chain;
b) accumulation of potassium and chlorine ions in the matrix;
c) intensification of lipid peroxidation;
d) increasing permeability of the inner membrane;
e) weakening function to accumulate calcium.

14. What processes can disrupt the function of cell receptor apparatus?
Variants of answer:
a) activation of membrane bound phospholipase;
b) activation of calmodulin;
c) activation of guanylate cyclise;
d) excess activation of adenylate cyclise;
e) desensitization;
f) intensification of lipid peroxidation.

15. What changes are the basis for ischemic cell damage?

Variants of answer:

a) increase in activity of Ca^{2+}-ATPase;

b) decrease in activity of Na^{+}/K^{+}-ATPase;

c) increase of Ca^{2+} ions in cell;

d) activation of phospholipase A_2;

e) activation of lipid peroxidation;

f) release of lysosomal protease;

g) inhibition of lipid peroxidation.

16. Specify the consequences of increased intracellular calcium in ischemic cell damage:

Variants of answer:

a) activation of phospholipase;

b) activation of proteases;

c) cells dehydration;

d) cell hyperhydration;

e) reducing permeability of mitochondrial membrane;

f) intensification of lipid peroxidation;

g) violation of energy mitochondrial function.

17. Acidosis in ischemic cell damage is caused by:

Variants of answer:

a) cell hyperhydration;

b) accumulation of reduced forms of NAD and NADP;

c) disorders oxidative formation of acetylcoenzyme A from fatty acids, pyruvate, and amino acids;

d) accumulation of lipid hydrolysis products;

e) enhance the absorption of calcium by mitochondria;

f) accumulation of chloride ions in cell.

18. What changes in intracellular metabolism in ischemic cell damage can be attributed to the compensatory?

Variants of answer:

a) decrease in protein synthesis;

b) accumulation of products of adenyl nucleotides catabolism;

c) mobilization of creatine phosphate;

d) uncoupling oxidation and phosphorylation in mitochondria;

e) intensification of anaerobic glycolysis;

f) loss of cell purine bases;

g) mobilization of glycogen;

h) intensification of arachidonic acid metabolism.

19. Which of the following phenomena indicate the irreversibility of cells reperfusion damage:

Variants of answer:

a) increase in intracellular sodium ions;
b) calcium paradox;
c) overload of mitochondria with calcium;
d) inactivation of membrane bound phospholipase;
e) activation of lysosomal enzymes;
f) significant loss of adenyl bases and creatine phosphokinase;
g) output of structural proteins from the cytoplasmic membrane.

20. What mechanisms are the basis for cells reperfusion damage?

Variants of answer:

a) activation of lipid peroxidation;
b) activation of enzyme of ATP synthesis and transport;
c) activation of membrane phospholipase;
d) accumulation of Ca^{2+} ions in cell;
e) increase in oxygen delivery in damaged cell;
f) increase of free radicals in cell.

21. Specify the features characteristic of cell apoptosis:

Variants of answer:

a) chaotic DNA breaks;
b) DNA cleavage in strictly defined areas;
c) release and activation of lysosomal enzymes;
d) formation of vacuoles containing fragments of nucleus and organelles;
e) cell swelling;
f) cell shrinkage.

22. What are the consequences of apoptosis:

Variants of answer:

a) phagocytosis of cell debris bounded membrane;
b) formation of a zone with plurality dead and damaged cells;
c) deaths and removal of dead cells;
d) development of inflammatory response;
e) autolysis of dead cells.

23. Specify the features characteristic of cell necrosis:

Variants of answer:

a) karyolysis;
b) condensation of chromatin;
c) cell swelling;
d) cell shrinkage;
e) damage of membranes;
f) formation of cell fragments containing chromatin.

24. Specify cells having a high reparative potential:
Variants of answer:
a) nerve;
b) epithelial;
c) muscular;
d) endothelial;
e) fibroblasts;
f) liver.

25. Specify non-enzymatic antioxidant defence factors of cells:
Variants of answer:
a) bivalent iron ions;
b) glucuronidase;
c) vitamin C;
d) vitamin D;
e) vitamin E.

26. Specify enzymes of antimutation system of cells:
Variants of answer:
a) restriction enzyme;
b) histaminase;
c) hyaluronidase;
d) DNA polymerase;
e) creatine phosphokinase;
f) ligase.

27. Specify organelles protecting cells against excessive accumulation of ionized calcium in it:
Variants of answer:
a) lysosomes;
b) ribosomes;
c) nucleus;
d) mitochondria;
e) sarcoplasmic reticulum;
f) Golgi apparatus.

28. Specify intracellular adaptive mechanisms in acute cell damage:
Variants of answer:
a) activation of glycolysis;
b) intensification the transport of calcium ions into the cell;
c) activation of buffer systems in hyaloplasm;
d) activation of antioxidant defence factors;
e) activation of DNA polymerases and ligases;
f) hyperplasia of subcellular structures.

29. Which of the following substances weaken the damaging effects of free radicals on the cell?

Variants of answer:

a) glutathione peroxidise;
b) oxygen;
c) superoxide dismutase;
d) selenium medications;
e) vitamin E;
f) catalase;
g) unsaturated fatty acids.

TYPICAL FORMS OF MICROCIRCULATORY DISORDERS

Indicate all correct answers

1. Vessels of microcirculatory system include:

Variants of answer:

a) true capillaries;
b) arterio-venular anastomoses;
c) lymphatic capillaries;
d) lymphatic postcapillaries;
e) artery.

2. What role does juxtacapillary blood flow has?

Variants of answer:

a) depositing of blood in the zone of microcirculation;
b) regulation of the microvascular permeability;
c) acceleration of venous flow;
d) regulation of capillary blood flow and transcapillary metabolism;
e) mobilization of blood from depot.

3. Direct impact on exchange of fluid between the tissue and capillaries has:

Variants of answer:

a) oncotic plasma pressure;
b) oncotic pressure in the cells;
c) hydrostatic pressure in the capillaries;
d) hydrostatic pressure in the interstitium;
e) oncotic pressure of interstitial fluid.

4. Specify substances increase the permeability of the microvessel walls:

Variants of answer:

a) calcium salt;

b) serotonin;
c) hyaluronic acid;
d) noradrenaline;
e) ascorbic acid;
f) histamine.

5. Specify the factors contributing to violation of the rheological properties of blood in microvessels:

Variants of answer:

a) reducing rigidity of the RBCs membrane;
b) decrease in deformability of RBCs;
c) increased platelet aggregation to form a reticulated suspension;
d) aggregation of RBCs and the formation of "coin columns";
e) changes in the structure of blood flow in the capillaries;
f) increase in concentrations of RBCs in the circulatory system.

6. Which organs have absolutely insufficient collaterals:

Variants of answer:

a) brain;
b) skeletal muscles;
c) heart;
d) spleen;
e) kidneys;
f) liver;
g) wall of the stomach.

7. How to change the linear and volumetric lymph velocity during a significant lowering of the protein content in the blood (less than 40 g / l):

Variants of answer:

a) increased;
b) decreased;
c) not changes.

8. Resorptive lymphatic insufficiency occurs when:

Variants of answer:

a) increasing the concentration of proteins in tissue;
b) increasing the concentration of proteins in blood;
c) decreasing the concentration of proteins in tissue;
d) decreasing the concentration of proteins in blood;
e) mechanical obstruction of lymph flow.

9. Dynamic lymphatic insufficiency occurs when:

Variants of answer:

a) decreasing the concentration of proteins in blood;

b) increasing the concentration of proteins in tissue;
c) overloading transport capacity of lymphatic vessels;
d) mechanical obstruction of lymph flow.

10. Excessive increase in juxtacapillary blood flow can occur during:
Variants of answer:
a) during hypercatecholamine crisis in patients with pheochromocytoma;
b) during stress;
c) arterial hyperemia;d) in anemias.

11. Development of "sludge" phenomenon is contributed:
Variants of answer:
a) ischemia of organ;
b) decrease in membrane potential of RBCs;
c) arterial hyperemia;
d) venous congestion;
e) increase in membrane potential of RBCs.

12. The consequences of capillary-trophic insufficiency:
Variants of answer:
a) dystrophy;
b) hypertrophy;
c) development of tumors;
d) violation of plastic processes in the tissues.

PERIPHERAL CIRCULATORY DISORDERS

Indicate all correct answers

1. Specify types of typical peripheral circulatory disorders:
Variants of answer:
a) coarctation of aorta;
b) arterial hyperemia;
c) venous congestion;
d) pathological deposit of blood;
e) ischemia;
f) hypertension.

2. Which biologically active substances play a role in the pathogenesis of arterial hyperemia?
Variants of answer:
a) acetylcholine;

b) catecholamines;
c) histamine;
d) bradykinin;
e) thromboxane A_2.

3. Which of the following factors can lead to arterial hyperemia:
Variants of answer:
a) peripheral nerve transaction;
b) mechanical irritation of the organ;
c) removal of elastic tourniquet from extremity;
d) obturation of the arterial lumen by thrombus;
e) action of mustard plasters on the skin.

4. Which mechanisms lead to the development of arterial hyperemia?
Variants of answer:
a) decrease in tone of sympathetic nerves;
b) increase in parasympathetic tone or sympathetic cholinergic vasodilator nerve;
c) increase adrenergic properties of arterioles and precapillaries;
d) increase in sensitivity of arterioles and capillaries walls to the action of vasodilator biologically active substances;
e) decreased tone of muscle fibers.

5. Name the main types of arterial hyperemia by its origin:
Variants of answer:
a) neurotonic;
b) obturative;
c) neuroparalytic;
d) myoparalytic;
e) compression.

6. Arterial hyperemia of neurotonic mechanism is due to:
Variants of answer:
a) stimulation of βadrenoreceptors of myocyte in arteriole walls;
b) stimulation of αadrenoreceptors of myocyte in arteriole walls;
c) spontaneous reduction of muscle tone of arterioles;
d) strengthening of parasympathetic influences on the arteriole wall;
e) weakening of parasympathetic influences on the arteriole wall.

7. What kinds of microcirculation changes are characteristic of arterial hyperemia?
Variants of answer:
a) increased the number of functioning capillaries;
b) reduction intracapillary pressure;
c) increase in blood flow velocity in the capillaries;

d) increased lymph outflow from the tissue;
e) increased filtration of fluid from the vessels into tissue.

8. Specify the features characteristic of arterial hyperemia:
Variants of answer:
a) cyanosis of organ;
b) redness of organ or tissue;
c) edema of organ;
d) increase in temperature of the surface tissue;
e) increasing tissue turgor.

9. Increasing the temperature of organ or tissue in arterial hyperemia is due to:
Variants of answer:
a) increased inflow of arterial blood;
b) increased oxidative processes;
c) increased lymph formation;
d) increased the number of functioning capillaries.

10. The red colour of organ in arterial hyperemia is caused by:
Variants of answer:
a) increased oxyhemoglobin content in blood;
b) decreased oxyhemoglobin content in blood;
c) increase of arterio-venous oxygen difference;
d) decrease in volumetric blood flow velocity;
e) increase in concentration of reduced hemoglobin in blood.

11. Indicate the possible consequences of arterial hyperemia:
Variants of answer:
a) micro and macrobleeding in the surrounding tissue;
b) vascular thrombosis of hyperemic area;
c) stasis in the capillaries of hyperemic area;
d) inhibition of metabolic processes in the hyperemic area.

12. In what conditions can develop venous congestion?
Variants of answer:
a) heart failure
b) increase in the minute blood ejection;
c) obstruction of the veins;
d) compression of afferent vessels;
e) peripheral nerve transaction;
f) compression of the veins by enlarged uterus during pregnancy;
g) mechanical irritation of the organ.

13. Indicate the signs of venous congestion:

Variants of answer:

a) increasing tissue turgor;
b) edema of organ;
c) lowering the temperature of the internal organs;
d) increase in temperature of the surface tissue;
e) cyanosis of organ or tissue;
f) redness of organ or tissue.

14. What kinds of microcirculation changes are characteristic of venous congestion?

Variants of answer:

a) slow down blood flow in small arteries, capillaries and veins;
b) pendulum blood flow;
c) increased lymph outflow from the tissue;
d) reduction of functioning veins and capillaries;
e) increasing arterio-venous pressure difference.

15. Indicate the possible consequences of venous congestion:

Variants of answer:

a) intensification of organ function;
b) decrease in function of organ or tissue;
c) tissue dystrophy;
d) sclerosis, cirrhosis of the organ;
e) hemorrhage;
f) increasing tissue oxygenation.

16. Which biologically active substance can cause ischemia:

Variants of answer:

a) histamine;
b) catecholamines;
c) acetylcholine;
d) bradykinin;
e) thromboxane A_2.

17. Which of the following factors can lead to ischemia:

Variants of answer:

a) arterioles thrombus obturation;
b) compression of veins by scar tissue;
c) angiospasm;
d) atherosclerotic vascular changes;
e) tumor compression of artery.

18. Specify the types of ischemia for reasons of occurrence:
Variants of answer:
a) vacant;
b) postanemic;
c) compression;
d) reflexive;
e) neuroparalytic;
f) obturative;
g) inflammatory.

19. Specify the features characteristic of ischemia:
Variants of answer:
a) lowering the temperature of the surface tissue;
b) lowering the temperature of the internal organs;
c) paleness of organ or tissue;
d) cyanosis of organ;
e) pain;
f) decrease in tissue turgor.

20. What kinds of microcirculation changes are characteristic of ischemia?
Variants of answer:
a) increasing arteriovenous pressure difference;
b) reduction in intravascular pressure;
c) increase in linear blood flow velocity;
d) increased resorption of fluid from the tissues into capillaries;
e) reducing the number of functioning capillaries.

21. What kind of changes can arise in the ischemia area?
Variants of answer:
a) necrosis;
b) acidosis;
c) attenuation of function;
d) intensification of function;
e) accumulation of Ca^{2+} in cells hyaloplasm;
f) increased content of K^{+} in cells;
g) increased content of Na^{+} in cells.

22. Compensation for violations of blood flow during ischemia is impeded by:
Variants of answer:
a) insufficient number of arterial anastomoses in the ischemic area;
b) accumulation of BAS (adenosine, PgE, prostacyclin, kinins) in the ischemic area;
c) atherosclerotic changes in the walls of collaterals;

d) increase in blood viscosity;
e) common disorders of blood circulation due to heart failure.

23. Identifying the factors that contribute to the true stasis:
Variants of answer:
a) increase in filtration of albumin into the surrounding tissue;
b) direct impact on tissues of high or low temperature;
c) dilatation of afferent vessels;
d) damage to tissues by acids and alkalis;
e) constriction of afferent vessels.

24. Indicate the possible consequences of deep vein thrombosis in lower limbs:
Variants of answer:
a) embolism of cerebral arteries;
b) pulmonary thromboembolism;
c) portal hypertension;
d) renal embolism;
e) intestinal embolism.

25. Specify emboli of endogenous origin:
Variants of answer:
a) cells of disintegrating tumors;
b) fat droplets in fractures of long bones;
c) accumulation of parasites;
d) lost contact thrombus;
e) air bubbles.

26. Air embolism can be caused by:
Variants of answer:
a) damage to large veins (neck, uterus);
b) heart surgery;
c) drop in atmospheric pressure from high to normal in divers;
d) rapid ascent to a height;
e) decompression of aircraft cabin.

27. Gas embolism arises in case of rapid transition:
Variants of answer:
a) from increased atmospheric pressure to normal;
b) from normal atmospheric pressure to decreased;
c) from normal atmospheric pressure to increased;
d) from decreased atmospheric pressure to increased.

28. Fat embolism can be caused by:
Variants of answer:
a) fracture of long bones and pelvic bones;

b) vertebral and ribs fracture;
c) intravenous injection of oil solutions;
d) intramuscular injection of oil solutions;
e) crushing of subcutaneous fat.

29. Paradoxical embolism can occur when:
Variants of answer:
a) insufficiency of aortic valve;
b) mitral valve stenosis;
c) nonclosure Botallo duct;
d) congenital interventricular septal defect.

30. The term "retrograde embolism" is used for:
Variants of answer:
a) transition of embolus from one circulation to another, bypassing the capillary bed;
b) moving of embolus against the flow blood;
c) moving of embolus through arterio-venous shunts;
d) moving of embolus through the interatrial septum cleft;
e) moving of embolus through nonclosure Botallo duct.

31. Emboli into the pulmonary circulation can be entered from:
Variants of answer:
a) venous system of the systemic circulation;
b) arterial system of the systemic circulation;
c) arterial system of the pulmonary circulation;
d) venous system of the pulmonary circulation;
e) right heart;
f) left heart.

32. Emboli into the systemic circulation can be entered from:
Variants of answer:
a) venous system of the systemic circulation;
b) arterial system of the systemic circulation;
c) arterial system of the pulmonary circulation;
d) venous system of the pulmonary circulation;
e) right heart;
f) left heart.

33. Specify the classic triad of portal vein embolism:
Variants of answer:
a) ascites;
b) hydropericardium;
c) splenomegaly;
d) varicose veins in anterior abdominal wall.

INFLAMMATION

Indicate all correct answers

1. Inflammation is seen as an adaptive response of the body, because:

Variants of answer:

a) limits the damage area, preventing the spread of flogogenic factor and products of alteration in the body;

b) inactivates flogogenic agent and products of tissue alteration;

c) prevent allergization of an organism;

d) mobilize body's protective factors.

2. The causes of aseptic inflammation can be:

Variants of answer:

a) veins thrombosis;

b) transient tissue hyperoxia;

c) tissue necrosis;

d) hemorrhage in tissue;

e) parenteral administration of sterile foreign proteins;

f) enteral administration of nonsterile foreign proteins.

3. The acute inflammatory response is characterized by:

Variants of answer:

a) formation of inflammatory granulomas;

b) increase in permeability of microcirculatory vessels;

c) accumulation of polynuclear giant cells in inflammation area;

d) accumulation of neutrophils in inflammation area.

4. The area of acute inflammation is characterized by the following physical and chemical changes:

Variants of answer:

a) hyperoncia;

b) hyponcia;

c) hyperosmia;

d) hyposmia;

e) acidosis;

f) extracellular increase in potassium ions.

5. What factors contribute to the development of edema in inflammation:

Variants of answer:

a) increase in oncotic pressure of blood;

b) increase in oncotic pressure of interstitial fluid;

c) increase in vascular permeability;

d) increase in pressure in a venous section of capillaries and in a venules;
e) increase in osmotic pressure of interstitial fluid;
f) decrease in osmotic pressure of interstitial fluid.

6. Vascular response in inflammation is characterized by:
Variants of answer:
a) short spasm;
b) arterial hyperemia replaced by venous;
c) increase in microvascular permeability;
d) slowing blood flow, passing in stasis;
e) decreased the number of functioning capillaries.

7. Factors contributing to the development of arterial hyperemia in inflammation are:
Variants of answer:
a) axon reflexes;
b) histamine;
c) noradrenaline;
d) bradykinin;
e) decrease in activity of vasoconstrictors;
f) increase in hyaluronidase activity.

8. Acidosis in inflammation area is caused by:
Variants of answer:
a) accumulation of fatty acids;
b) accumulation of chloride ions;
c) increase in polypeptides content;
d) accumulation of sodium ions;
e) accumulation of potassium ions;
f) accumulation of lactic acid.

9. Increasing the osmotic pressure in inflamed tissue is due to:
Variants of answer:
a) increased anabolic processes;
b) increased catabolic processes;
c) increase in amount of electrolytes;
d) decrease in amount of electrolytes.

10. What signs of inflammation are depend on the increase of osmotic pressure in the inflamed tissue?
Variants of answer:
a) swelling;
b) redness;
c) heat;

d) pain;
e) impaired function.

11. Specify the factors that cause inflammatory pain:
Variants of answer:
a) prostaglandins group E;
b) histamine;
c) increased H^+ions;
d) increased K^+ions;
e) kinins;
f) rise in body temperature;
g) mechanical irritation of nerve endings.

12. Specify the normal sequence of emigration of leukocytes in the center of acute inflammation:
Variants of answer:
a) monocytes, lymphocytes, neutrophils;
b) neutrophils, lymphocytes, monocytes;
c) monocytes, neutrophils, lymphocytes;
d) neutrophils, monocytes, lymphocytes.

13. Adhesion of leukocytes to endothelium of microcirculatory vessels is found primarily in:
Variants of answer:
a) arterioles;
b) metarterioles;
c) capillaries;
d) postcapillary venules.

14. Specify substances with chemoattractant properties for neutrophils:
Variants of answer:
a) IL 2;
b) IL 8;
c) Leukotriene B4;
d) fragment of complement C5a;
e) fragment of complement C3b;
f) bacterial lipopolysaccharide;
g) platelet activating factor.

15. Which of the following compounds have opsonins properties:
Variants of answer:
a) Ig G;
b) Ig E;
c) Pg E2;
d) fragment of complement C3b.

16. Occurrence of "respiratory burst" in leukocytes is associated with:
Variants of answer:
a) activation of NADP-oxidase;
b) activation of hexose monophosphate way of glucose oxidation;
c) formation of active oxygen metabolites;
d) activation of anaerobic glycolysis.

17. Which of the following cells are sources of inflammatory mediators?
Variants of answer:
a) basophils;
b) thrombocytes;
c) eosinophils;
d) endothelial cells.

18. Mediators of early phase of inflammation (primary mediator) are:
Variants of answer:
a) histamine;
b) serotonin;
c) noradrenaline;
d) lysosomal enzymes;
e) kinins;
f) prostaglandins;
g) cyclic nucleotides.

19. Specify inflammatory mediators, which are cell origin:
Variants of answer:
a) serotonin;
b) kinins;
c) lymphokines;
d) histamine;
e) fragments of activated complement;
f) lysosomal enzymes;
g) lysosomal cationic proteins;
h) prostaglandins;
i) blood clotting factors.

20. Specify inflammatory mediators, which are humoral origin:
Variants of answer:
a) serotonin;
b) kinins;
c) lymphokines;
d) histamine;
e) fragments of activated complement;
f) lysosomal enzymes;

g) lysosomal cationic proteins;
h) prostaglandins;
i) blood clotting factors.

21. Inflammatory mediators, causing an increase of vascular permeability in inflammation are:

Variants of answer:
a) heparin;
b) histamine;
c) bradykinin;
d) interferon;
e) serotonin;
f) leukotrienes.

22. Inflammatory mediators, formed from phospholipids of cell membranes, are:

Variants of answer:
a) prostaglandins;
b) histamine;
c) bradykinin;
d) leukotrienes;
e) substance P.

23. Which of these substances can be the source of vasoactive kinins in inflammation?

Variants of answer:
a) phospholipids of cell membranes;
b) high molecular kininogen;
c) complement components;
d) fibrin.

24. Kallikreinkinin system include:

Variants of answer:
a) Hageman factor;
b) prekallikrein;
c) complement;
d) bradykinin.

25. Specify the properties possessed by bradykinin:

Variants of answer:
a) causes a drop in blood pressure;
b) contract the smooth muscles;
c) increase in permeability of microcirculatory vessels;
d) irritates pain nerve endings;
e) is a chemoattractant for leukocytes.

26. Mechanisms of exudation in inflammation are:

Variants of answer:

a) increase in permeability of microcirculatory vessels;

b) increase in hydrostatic pressure in the vessels of inflammatory area;

c) increase in colloid osmotic pressure of interstitial fluid in the inflammatory area.

27. The exudate is characterized by:

Variants of answer:

a) relative density higher than 1015;

b) relative density lower than 1015;

c) protein content more than 30 g/l;

d) pH is 6.0–7.0 and less;

e) pH is 7.0 or higher.

28. Main differences of transudate and exudate in inflammation are that the latter includes:

Variants of answer:

a) large number of blood cells (white blood cells, etc.);

b) large number of destroyed tissue elements;

c) small amounts of protein;

d) large amounts of protein.

29. Serous exudate:

Variants of answer:

a) is characterized by moderate protein content;

b) is characterized by a low relative density;

c) is characterized by increased content of cell elements;

d) is typical for inflammation of serous membranes (heart, joints);

e) most often is observed in viral, immune inflammation.

30. Purulent exudate:

Variants of answer:

a) characterized by the presence of large number of pus cells;

b) characterized by a high proteolytic activity;

c) is typical for inflammation caused by coccal infection;

d) most often is observed in viral, immune inflammation;

e) more common for acute inflammation.

31. Fibrinous exudate:

Variants of answer:

a) characterized by high content of fibrin;

b) is observed in inflammation, accompanied by a significant increase in vascular permeability;

c) is typical for inflammation of oral mucosa, bronchi, stomach, intestines;
d) is found only in chronic inflammatory processes;
e) can be observed in diphtheria, dysentery, pulmonary tuberculosis;
f) is typical for inflammation caused by coccal infection.

32. The greatest damage of basement membrane of microcirculatory vessels is expected in inflammation, with following exudate:

Variants of answer:
a) serous;
b) purulent;
c) catarrhal;
d) fibrinous;
e) hemorrhagic.

33. Select the cells that provide elimination of tissue defect in inflammation:

Variants of answer:
a) T-lymphocytes;
b) B-lymphocytes;
c) fibroblasts;
d) monocytes;
e) histiocytes;
f) parenchymatous cells.

34. "Chronic inflammatory cells" include:

Variants of answer:
a) epithelioid cells;
b) macrophages;
c) mast cells;
d) neutrophils.

35. Note the processes which inhibit inflammation:

Variants of answer:
a) vasoconstriction;
b) vasodilation;
c) increase in vascular permeability;
d) decrease in vascular permeability;
e) increased emigration of leukocytes;
f) decreased emigration of leukocytes.

36. Note the anti-inflammatory hormones:

Variants of answer:
a) aldosterone;
b) cortisol;
c) estrogens;

d) thyroxine;
e) corticosteron.

37. Antiinflammatory action of glucocorticoids is due:
Variants of answer:
a) inhibit of phospholipase A_2 activity;
b) decrease in vascular permeability;
c) inhibit the production of interleukin;
d) inhibit activation of complement system.

38. How estrogens inhibit inflammation?
Variants of answer:
a) increase in capillary permeability;
b) decrease in capillary permeability;
c) inhibiting the activity of hyaluronidase;
d) increase in hyaluronidase activity.

INFECTIOUS PROCESS. FEVER

Indicate all correct answers

1. There are following periods in the development of infectious process:
Variants of answer:
a) latent;
b) prodromal;
c) incubation;
d) outcome;
e) multiple organ failure;
f) main manifestations.

2. The protecting factors of pathogen from the bactericidal mechanisms of host are:
Variants of answer:
a) capsule;
b) flagella;
c) catalase;
d) adhesins;
e) protease.

3. Superinfection is:
Variants of answer:
a) reinfection of the body by the same pathogen until recovery;
b) repeated (after recovery of the patient) the occurrence of infection caused by the same organism;

c) presence of bacteria or viruses in blood;
d) infectious process caused simultaneously by two or more agents;
e) infectious process that develops on the background of existing (primary) infection caused by other microorganisms.

4. Differences of sepsis from other infections:
Variants of answer:
a) polyetiology disease;
b) caused by G^+ microorganisms only;
c) does not contagious;
d) fail to develop immunity;
e) strong immunity;
f) there is no specific morphological substrate.

5. What factors can cause development of fever?
Variants of answer:
a) aseptic inflammation;
b) massive hemolysis;
c) sunburn skin;
d) emotional excitement;
e) intense exercise.

6. Non-infectious fever is developed at:
Variants of answer:
a) tissue necrosis;
b) thyrotoxicosis;
c) inflammation caused by physical or chemical factors;
d) malignant tumor;
e) exogenous hyperthermia;
f) extensive hemorrhage;
g) massive intravascular hemolysis.

7. Similar to fever conditions may be developed at:
Variants of answer:
a) action of infectious agent;
b) emotional stress;
c) taking medicines;
d) thyrotoxicosis;
e) presence of aseptic inflammation focus.

8. Specify the mechanisms involved in the increase of body temperature at fever:
Variants of answer:
a) increase in coupling oxidation and phosphorylation;

b) peripheral vasoconstriction;
c) intensification of contractile "muscle thermogenesis";
d) decreased sweating;
e) activation of oxidative processes;
f) increased sweating.

9. The degree of increase in body temperature at a fever depends on:
Variants of answer:
a) concentration of exogenous pyrogens in tissues;
b) intensity of cytokine production by target cells;
c) sensitivity of thermoregulatory center to the action of pyrogens;
d) patient's age;
e) thermal insulation properties of clothing.

10. The character of temperature curve at a fever depends essentially on:
Variants of answer:
a) etiologic factor;
b) features of pathogenesis of underlying disease;
c) functional state of endocrine system;
d) environmental temperature;
e) medical interventions;
f) functional state of immune system.

11. The mechanism of contractile thermogenesis includes:
Variants of answer:
a) direct effect of secondary pyrogens on muscles;
b) direct effect of primary pyrogens on muscles;
c) contraction of skeletal muscles;
d) excitation of skin cold receptors;
e) reflexive excitation of thermoregulatory center;
f) activation of the brain reticular formation;
g) excitation of motor neurons of the spinal cord;
h) uncoupling of oxidative phosphorylation.

12. Not contractile thermogenesis at a fever is contributed:
Variants of answer:
a) excitation of motor neurons of the spinal cord;
b) increased production of thyrotropin-releasing hormone;
c) activation of sympathoadrenal system;
d) decreased sweating;
e) hyperglycemia, hyperlipidemia.

13. What factors can cause a weakened febrile response to pyrogenic action?
Variants of answer:
a) hypothyroidism;

b) hyperthyroidism;
c) damage to the spinal cord at cervical segments;
d) early postnatal period of child development;
e) during puberty;
f) advanced age.

14. What is the chemical nature of exogenous pyrogens produced by microorganisms?

Variants of answer:
a) lipopolysaccharides;
b) phospholipids;
c) proteins;
d) mucopolysaccharides.

15. After intravenous administration of bacterial pyrogen to animal, can be observed:

Variants of answer:
a) persistent decrease in the number of circulating leukocytes;
b) short-term leukopenia, replaced by redistributive leukocytosis;
c) increase in phenomenon of leukocyte margination;
d) activation of phagocytes;
e) activation of leukocytes and release by them secondary pyrogens;
f) increase in excitability and activity of "cold" hypothalamic neurons;
g) increase in excitability and activity of "heat" hypothalamic neurons.

16. Which of the following factors can be inducers of the synthesis of endogenous pyrogens?

Variants of answer:
a) bacterial endotoxins;
b) bacterial exotoxins;
c) products of tissue cytolysis;
d) biogenic amines;
e) antigens and immune complexes;
f) hormones;
g) prostaglandins.

17. Select the cells that are the main producers of endogenous pyrogen:

Variants of answer:
a) thrombocytes;
b) monocytes;
c) tissue macrophages;
d) erythrocytes;
e) lymphocytosis;
f) granulocytes.

18. Which of the following compounds have properties of endogenous pyrogens?

Variants of answer:

a) IL1;
b) IL2;
c) IL4;
d) IL6;
e) TNFα.

19. What action is rendered by the endogenous pyrogens on neurons of the thermoregulatory center?

Variants of answer:

a) increase in threshold of sensitivity of central cold thermoreceptors;
b) decrease in threshold of sensitivity of central cold thermoreceptors;
c) increase in threshold of sensitivity of central heat thermoreceptors;
d) decrease in threshold of sensitivity of central heat thermoreceptors;
e) does not effect on the sensitivity of central thermoreceptors.

20. Specify the mechanisms to increase of body temperature in the first stage of fever:

Variants of answer:

a) offset the setpoint of temperature homeostasis at a higher level;
b) increase in threshold of sensitivity of central heat thermoreceptors;
c) increase in threshold of sensitivity of central cold thermoreceptors;
d) increase in tone of sympathetic nerves;
e) decrease in tone of parasympathetic nerves.

21. Specify features of increase in body temperature, typical for the first stage of fever:

Variants of answer:

a) decrease in heat elimination;
b) increase in heat elimination;
c) dependence of body temperature from ambient;
d) violation of thermoregulation;
e) independence of body temperature from heatinsulating properties of clothing;
f) dependence of body temperature from humidity.

22. Specify the characteristic manifestations of the first stage of fever:

Variants of answer:

a) chills;
b) feeling hot;
c) pale skin;
d) skin hyperemia;
e) skin dryness;

f) decrease in diuresis;
g) increase in diuresis.

23. How can change the absolute values of heat production and heat elimination in the first stage of febrile reaction?

Variants of answer:

a) increase in heat production, decrease in heat elimination;
b) heat production does not change, decrease in heat elimination;
c) increase in heat production, heat elimination is also increased, but in less degree;
d) heat production and heat elimination are changed equivalent;
e) decrease in heat production , heat elimination does not change.

24. Oppression of heat elimination in the first stage of fever is contributed:

Variants of answer:

a) intensification of heat production;
b) uncoupling of oxidative phosphorylation;
c) sympathoadrenal reaction;
d) inhibition of heat emission;
e) skin vasoconstriction.

25. Specify the metabolic changes observed in the second stage of fever:

Variants of answer:

a) activation of glycogenolysis;
b) inhibition of glycogenolysis;
c) decreased ketone bodies in blood;
d) increased ketone bodies in blood;
e) positive nitrogen balance;
f) negative nitrogen balance;
g) intensification of lipolysis;
h) intensification of lipogenesis.

26. Specify the characteristic manifestations of the second stage of fever:

Variants of answer:

a) chills;
b) feeling hot;
c) pale skin;
d) skin hyperemia;
e) skin dryness;
f) decrease in diuresis;
g) increase in diuresis.

27. The third stage of fever is characterized by:

Variants of answer:

a) predominance of heat production on heat elimination;

b) predominance of heat elimination on heat production;
c) muscular tremors;
d) skin hyperemia;
e) increased sweating.

28. Which variant lowering the body temperature in 3rd stage of fever is the most favorable?

Variants of answer:
a) lytic;
b) critical.

29. The negative effects of fever can be caused by:

Variants of answer:
a) hyperfunction of heart during prolonged high fever;
b) fast decrease in body temperature from pyretic to normal or subnormal levels;
c) hectic dynamics of body temperature;
d) metabolic disorders caused by high fever.

30. Needs for antipyretics is indicated by the following conditions:

Variants of answer:
a) rise in body temperature to 39–40 °C;
b) heart failure;
c) adulthood;
d) early childhood;
e) wound infection.

IMMUNOPATHOLOGICAL PROCESSES

Indicate all correct answers

1. Typical forms of immunity disorders include:

Variants of answer:
a) thymic hypotrophy;
b) lymphadenopathy;
c) immunodeficiency;
d) pathological tolerance;
e) lymphocytic leukemia;
f) reaction "graft versus host".

2. Active sensitization can be caused by:

Variants of answer:
a) injection of specific antibodies;
b) injection of antigens;

c) injection of sensibilized lymphocytes-effectors;
d) injection of immunostimulants;
e) injection of immunosuppressants.

3. What mediators of mast cells are new-synthesized:
Variants of answer:
a) platelet activating factor;
b) eosinophils chemotactic factor;
c) histamine;
d) basophilic kallikrein;
e) leukotrienes C_4, $D_{4;}$
f) Pg $D_{2.}$

4. The release of histamine from mast cells is reduced at:
Variants of answer:
a) stimulation of $\beta_2$adrenergic receptors;
b) blockade of $\beta_2$adrenergic receptors;
c) stimulation of H_2 histamine receptors;
d) blockade of H_2 histamine receptors;
e) stimulation of receptors for Pg $E_{2;}$
f) stimulation of αadrenergic receptors.

5. Give examples of reactions developing on I type of immune damage:
Variants of answer:
a) urticaria;
b) myasthenia gravis;
c) anaphylactic shock;
d) swelling Kwinke;
e) serum sickness;
f) pollen allergy.

6. Antibodies in atopic diseases are:
Variants of answer:
a) Ig $G_{1;}$
b) Ig $G_{4;}$
c) Ig E;
d) Ig A;
e) Ig M.

7. The main role in pathogenesis of diseases developing on I type of immune damage play:
Variants of answer:
a) leukotrienes;
b) platelet activating factor;
c) IL2;

d) transferring factor;
e) macrophage activating factor;
f) lymphotoxin;
g) histamine.

8. Allergic reaction developing on I type of immune damage is characterized by:

Variants of answer:

a) leading role of Ig E in the pathogenesis;
b) reactions occur within 15–20 minutes after repeated contact with the allergen;
c) reactions occur within 24–48 hours after repeated contact with the allergen;
d) in mechanism of development of disease manifestations the main role play: histamine, platelet activating factor, kinins, leukotrienes;
e) in mechanism of development of disease manifestations the main role play lymphokines.

9. In 1 stage of reaginic type of allergic reactions occur:

Variants of answer:

a) cooperation of T, B-lymphocytes and macrophages;
b) cooperation of mast cells, neutrophils and eosinophils;
c) transformation of differentiated B-lymphocytes in lymphoblasts;
d) formation of clone of plasma cells;
e) formation of clones of specific T lymphocytes-effectors;
f) synthesis and accumulation of antibodies;
g) activation of mast cells.

10. Specify which processes play a main role in pathogenesis of diseases developing on I type of immune damage play:

Variants of answer:

a) interaction of circulating antibodies (IgG, IgM class) with antigen on surface of target cells with the participation of complement, phagocytes and NK cells;
b) interaction of circulating antibodies (IgG, IgM class) with excess of antigen to form immune complexes with the participation of complement;
c) interaction of sensitized lymphocytes with antigen;
d) interaction of antibodies (IgE, IgG_4) fixed on the target cells with antigen without complement.

11. Specify the primary target cells in allergic reactions reaginic type:

Variants of answer:

a) neutrophils;
b) basophils;
c) eosinophils;
d) mast cells;
e) thrombocytes.

12. Specify the secondary target cells in allergic reactions developing by I type of immune damage:

Variants of answer:

a) neutrophils;

b) basophils;

c) eosinophils;

d) fibroblasts;

e) mast cells.

13. Specify the optimal time to reproduce anaphylactic shock in guinea pigs after the passive sensitization:

Variants of answer:

a) 15–20 minutes;

b) 6–8 hours;

c) 22–24 hours;

d) 6–8 days;

e) 14–15 days.

14. Specify which of the following diseases can be developed in type II immune damage:

Variants of answer:

a) Hashimoto thyroiditis;

b) pernicious anemia Addison-Biermer;

c) tuberculin reaction;

d) contact dermatitis;

e) autoimmune hemolytic anemia;

f) serum sickness.

15. Specify which processes play a main role in pathogenesis of diseases developing on II type of immune damage play:

Variants of answer:

a) interaction of circulating antibodies (IgG, IgM class) with antigen on surface of target cells with the participation of complement, phagocytes and NK cells;

b) interaction of circulating antibodies (IgG, IgM class) with excess of antigen to form immune complexes with the participation of complement;

c) interaction of sensitized lymphocytes with antigen;

d) interaction of antibodies (IgE, IgG_4) fixed on the target cells with antigen without complement.

16. Antibodies in II and III types of immune damage are related to:

Variants of answer:

a) Ig $G_{1;}$

b) Ig $G_{4;}$

c) Ig $G_{3;}$

d) Ig E;
e) Ig M.

17. Specify which mediators play a main role in pathogenesis of diseases developing on III type of immune damage play:

Variants of answer:

a) histamine;
b) leukotrienes C_4, $D_{4;}$
c) platelet activating factor;
d) cationic proteins;
e) oxidants;
f) anaphylatoxins;
g) C_{567} component of complement;
h) kinins.

18. Specify which of the following diseases can be developed in type III immune damage:

Variants of answer:

a) pollen allergy;
b) anaphylactic shock;
c) serum sickness;
d) autoimmune hemolytic anemia;
e) allergic alveolitis;
f) contact dermatitis;
g) acute glomerulonephritis.

19. Specify which processes play a main role in pathogenesis of diseases developing on III type of immune damage play:

Variants of answer:

a) interaction of circulating antibodies (IgG, IgM class) with antigen on surface of target cells with the participation of complement, phagocytes and NK cells;

b) interaction of circulating antibodies (IgG, IgM class) with excess of antigen to form immune complexes with the participation of complement;

c) interaction of sensitized lymphocytes with antigen;

d) interaction of antibodies (IgE, IgG_4) fixed on the target cells with antigen without complement.

20. Which reactions and diseases developing in type IV of immune damage:

Variants of answer:

a) contact dermatitis;
b) Arthus phenomenon;
c) bacterial allergy;
d) food allergy;
e) graft rejection;
f) Hashimoto thyroiditis.

21. Specify which mediators play a main role in pathogenesis of diseases developing on IV type of immune damage play:

Variants of answer:

a) leukotrienes;

b) platelet activating factor;

c) IL2;

d) eosinophils chemotactic factor;

e) transferring factor;

f) macrophage activating factor;

g) factor depressing migration of macrophages;

h) lymphotoxin;

i) histamine.

22. Allergic reaction developing on IV type of immune damage is characterized by:

Variants of answer:

a) leading role of sensitized T-lymphocytes in the pathogenesis;

b) reaction begins to manifest after 6–8 hours and reaches a maximum 24–48 hours after reexposure to the allergen;

c) reaction begins to manifest after 20–30 minutes;

d) in mechanism of development of disease manifestations the main role play lymphokines;

e) in mechanism of development of disease manifestations the main role play histamine, platelet activating factor, kinins, leukotrienes.

23. Which cells is the basis of inflammatory infiltrate in diseases developing on IV type of immune damage:

Variants of answer:

a) neutrophils;

b) lymphocytosis;

c) monocytes;

d) eosinophils.

24. Specify which processes play a main role in pathogenesis of diseases developing on IV type of immune damage play:

Variants of answer:

a) interaction of circulating antibodies (IgG, IgM class) with antigen on surface of target cells with the participation of complement, phagocytes and NK cells;

b) interaction of circulating antibodies (IgG, IgM class) with excess of antigen to form immune complexes with the participation of complement;

c) interaction of sensitized lymphocytes with antigen;

d) interaction of antibodies (IgE, IgG_4) fixed on the target cells with antigen without complement.

25. Which of the following diagnostic tests are provocative?

Variants of answer:

a) scratch skin tests;

b) intradermal injection of allergen;

c) intranasal administration of allergen;

d) inhalation of allergen in aerosol form;

e) instillation of allergen in conjunctiva;

f) radioallergosorbent test;

g) radioimmunosorbent test.

26. Autoimmune diseases can be caused by:

Variants of answer:

a) disorders of immune system, manifested by appearance of antibodies to antigens of their own normal cells;

b) denaturation of proteins in own cells and tissues;

c) formation of antibodies to the proteins of cells and organs, isolated from the immune system in ontogenesis;

d) formation of antibodies cross-reacting with foreign and self proteins;

e) action of biogenic amines released by mast cells;

f) development of tolerance state.

27. Specify probable pathogenetic mechanisms of cellular damage in autoimmune diseases:

Variants of answer:

a) IgE-mediated reactions;

b) antibody dependent cellular cytotoxicity;

c) opsonization of target cells followed by phagocytosis;

d) immunocomplex reaction;

e) cell-mediated reactions with participation of sensitized lymphocytes;

f) interaction of circulating antibodies with components of membranes of target cells followed by activation of complement.

28. Specify diseases related to autoimmune:

Variants of answer:

a) Hashimoto thyroiditis;

b) Arthus phenomenon;

c) rheumatoid arthritis;

d) myasthenia gravis;

e) urticaria;

f) systemic lupus erythematosus.

29. Specify the cells, tissues and organs containing primary autoantigens:

Variants of answer:

a) thyroid gland;

b) crystalline lens;
c) cells of periosteum;
d) nerve cells;
e) sperm cells;
f) cells of renal capsule;
g) myocardial cells.

30. What are autoimmune diseases caused by the formation of organo-specific autoantibodies?

Variants of answer:
a) Hashimoto thyroiditis;
b) postvaccination encephalomyelitis;
c) systemic lupus erythematosus;
d) rheumatoid arthritis;
e) postinfarction myocarditis.

31. What are autoimmune diseases caused by the formation of organo-nonspecific autoantibodies?

Variants of answer:
a) Hashimoto thyroiditis;
b) postvaccination encephalomyelitis;
c) systemic lupus erythematosus;
d) rheumatoid arthritis;
e) postinfarction myocarditis.

32. Immunodeficiencies may be based on the insufficiency of these "factors" and / or processes:

Variants of answer:
a) production of antibodies;
b) phagocytosis with mononuclear phagocytes;
c) phagocytosis with granulocyte;
d) T-lymphocytes;
e) complement system;
f) IL;
g) transferring.

33. Monoclonal antibodies recognize a single:

Variants of answer:
a) antigen;
b) bacterium;
c) epitope;
d) B cell;
e) virus.

34. Suppression of the immune response mediate:
Variants of answer:
a) IL 10;
b) transforming growth factor β;
c) insulin;
d) IL 2;
e) antiidiotypic antibodies.

35. Name the consequences of complement system activation:
Variants of answer:
a) inhibition of phagocytosis;
b) activation of polymorphonuclear leukocytes;
c) stimulation of histamine secretion from mast cells;
d) formation of through channels in cytoplasmic membrane of cells;
e) death of target cells;
f) dehydration of target cells.

36. Hinder for implementation of first stage of immune response:
Variants of answer:
a) lack of antigenrecognition receptors on lymphocytes;
b) deficiency of lysosomal granules in macrophages;
c) violation of antigen loading on the HLA molecule;
d) decreased proliferative activity of T-lymphocytes;
e) decrease in absorptive activity of macrophages.

37. Violation of effector phase of cellular immune response is due:
Variants of answer:
a) inhibition of reactions of perforingranzymes cytotoxicity;
b) deficiency of γ-interferon;
c) violation of phagocytosis of immune complexes;
d) deficiency of complement system;
e) oppression of receptordependent apoptosis of target cells.

38. Deficiency of T cell immunity causes:
Variants of answer:
a) recurrent purulent inflammatory processes;
b) chronic bacterial infections of respiratory tract;
c) mycosis;
d) recurrent gastrointestinal infections;
e) viral infection;
f) pustulous skin lesions;
g) tumors.

39. Deficiency of humoral immunity is accompanied by:
Variants of answer:
a) recurrent purulent inflammatory processes;

b) chronic bacterial infections of respiratory tract;
c) mycosis;
d) recurrent gastrointestinal infections;
e) viral infection;
f) pustulous skin lesions;
g) tumors.

40. Reducing efficiency of phagocytosis is observed in conditions:
Variants of answer:
a) leukopenia;
b) activation of sympathoadrenal system;
c) activation of complement system;
d) opsonins deficiency.

41. Specify possible causes of phagocytes dysfunction are:
Variants of answer:
a) insufficient activity of glucose6phosphate dehydrogenase;
b) insufficiency of pinocytosis;
c) decrease in reactive oxygen species formation in phagocyte;
d) insufficient activity of the lysosomal enzyme;
e) activation of glucuronidase synthesis;
f) violation of phagolysosomes formation.

42. Causes of incomplete phagocytosis can be:
Variants of answer:
a) excess glucocorticoid levels;
b) mild increase in body temperature;
c) insufficiency of leukocyte myeloperoxidase;
d) hypergammaglobulinemia.

43. Primary deficiencies of complement system are the basis for:
Variants of answer:
a) immunocomplex diseases;
b) hypoplasia of lymphoid organs;
c) syndrome of lazy leukocytes;
d) common variable immune deficiency;
e) granulomatous disease.

44. Hereditary and congenital immunodeficiencies can be:
Variants of answer:
a) combined with defeat of cellular (T) and humoral (B) components of immunity;
b) with predominant defect of cellular immunity;

c) with predominant violation of antibodies production by Blymphocytes;
d) with defects of phagocytosis by microphages;
e) with defects of mononuclear phagocytes;
f) with violation of chemotactic factors production;
g) insufficiency of humoral factors of nonspecific protection.

45. Specify primary immunodeficiencies:
Variants of answer:
a) syndrome of "lazy" leukocytes and monocytopenia (ChediakHigashi syndrome);
b) absence of stem cells;
c) DiGeorge syndrome;
d) AIDS in childhood;
e) Bruton agammaglobulinemia;
f) Klinefelter syndrome.

46. Immunodeficiency states with a primary lesion of cellular immunity include:
Variants of answer:
a) DiGeorge syndrome;
b) ChediakHigashi syndrome;
c) WiskottAldrich syndrome;
d) LouisBar syndrome.

47. Xlinked agammaglobulinemia results from a mutation in:
Variants of answer:
a) interferon-g receptor;
b) HLA gene;
c) CD40L (CD154);
d) tyrosine kinase gene.

48. Congenital Bruton agammaglobulinemia is characterized by:
Variants of answer:
a) affected only boys;
b) patients susceptible to viral infection;
c) number of lymphocytes in peripheral blood and their response to phytohemagglutinin not differ from the normal;
d) number of plasma cells is significantly reduced;
e) content of IgG in peripheral blood is not different from the norm, and IgA and IgM slightly reduced;
f) IgG content in peripheral blood is reduced in 10 times, IgA, and IgM 100 times.

49. DiGeorge syndrome is characterized by the following features:
Variants of answer:
a) congenital nature of pathology;
b) genetic nature of pathology;
c) thymic hypoplasia;
d) defects in structure and function of parathyroid;
e) lack (or significant decrease) delayedtype hypersensitivity;
f) absence of humoral antibodies;
g) hypocalcemia;
h) hypercalcemia.

50. Secondary immunodeficiency can occur when:
Variants of answer:
a) extensive burns
b) X-ray irradiation, corticosteroid therapy, thymectomy;
c) leukemia;
d) viral, bacterial infections;
e) malignant tumors;
f) gas embolism;
g) septic conditions;
h) renal arterial hypertension.

51. Which cells of immune system is the main target for HIV?
Variants of answer:
a) B-lymphocytes;
b) CD8;
c) CD4;
d) T-suppressor.

52. Defects in neutrophil NADP-oxidase system produce:
Variants of answer:
a) chronic granulomatous disease;
b) ChediakHigashi disease;
c) leukocyte adhesion deficiency;
d) streptococcal infection.

TYPICAL METABOLIC DISORDERS. DISORDERS OF PROTEIN, VITAMINS, NUCLEIC ACIDS METABOLISMS. STARVATION

Indicate all correct answers

1. Specify the conditions that are accompanied by a positive nitrogen balance:

Variants of answer:

a) organism growth;
b) pregnancy;
c) starvation;
d) thermal burns;
e) excessive secretion or use of anabolic hormones;
f) excessive secretion or use of catabolic hormones;
g) infectious diseases.

2. Specify the conditions that are accompanied by a negative nitrogen balance:

Variants of answer:

a) organism growth;
b) pregnancy;
c) starvation;
d) thermal burns;
e) excessive secretion or use of anabolic hormones;
f) excessive secretion or use of catabolic hormones;
g) infectious diseases.

3. Specify pathological conditions accompanied by hyperproteinemia:

Variants of answer:

a) starvation;
b) hemoconcentration;
c) intensification of antibodies synthesis;
d) liver diseases;
e) protein malabsorption;
f) proteinuria.

4. Specify pathological conditions accompanied by hypoproteinemia:

Variants of answer:

a) starvation;
b) hemoconcentration;
c) intensification of antibodies synthesis;
d) liver diseases;
e) protein malabsorption;
f) proteinuria.

5. Paraprotein — it is:
Variants of answer:
a) qualitative changes gamma globulins;
b) qualitative changes albumins;
c) decrease in albumin;
d) change in ratio of protein fractions.

6. The reasons for reducing basal metabolism are:
Variants of answer:
a) state of sensitization;
b) hypoxia of different genesis;
c) endocrine diseases;
d) starvation;
e) sleeping state.

7. The reasons for increasing basal metabolism are:
Variants of answer:
a) moderate activation of cardiac activity and respiration;
b) increase in tone of sympathetic nerves
c) febrile state;
d) hypoendocrinism;
e) CNS lesions.

8. The first period of starvation is characterized by:
Variants of answer:
a) decrease in basal metabolic rate;
b) increasing concentration of insulin in blood;
c) decreasing concentration of glucose in blood;
d) increase in glycogen stores;
e) activation of gluconeogenesis.

9. Manifestations of second period of starvation include:
Variants of answer:
a) drowsiness;
b) tachycardia;
c) bradipnea;
d) leukocytosis;
e) development of edemas.

10. Proteinenergy malnutrition is characterized by:
Variants of answer:
a) decreased amino acids in blood;
b) increased amino acids in blood;
c) decreased protein content of blood;

d) increased protein content of blood;
e) decreased urea in blood;
f) increased urea in blood.

11. Specify the clinical and laboratory characteristics of kwashiorkor disease:

Variants of answer:
a) hyperglycemia;
b) edemas;
c) wolfish appetite;
d) stearrhea;
e) substitution of muscle tissue by adipose.

12. Specify common manifestations characteristic of protein deficiency syndromes kwashiorkor and marasmus:

Variants of answer:
a) "red" color of the skin;
b) occurs in children after weaning;
c) development of edemas;
d) mental retardation;
e) impaired growth;
f) hypoglycaemia.

13. Neutralization of ammonia in the body can occur through:

Variants of answer:
a) deamination of amino acids;
b) urea synthesis;
c) glycogen synthesis;
d) glutamine synthesis;
e) synthesis of biogenic amines.

14. Ammonia encephalopathy can develop in:

Variants of answer:
a) hepatitis;
b) stress;
c) prolonged emotional excitation;
d) liver cirrhosis.

15. Specify the form of pathology, which are based on a hereditary defect in metabolism of amino acid tyrosine:

Variants of answer:
a) homogentisuria;
b) tyrosinosis;
c) phenylketonuria;
d) albinism.

16. Exchange of which amino acids is associated with the formation biogenic amines?

Variants of answer:

a) arginine;
b) alanine;
c) histidine;
d) tyrosine;
e) tryptophan.

17. Vitamin A deficiency results in:

Variants of answer:

a) keratomalacia;
b) polyneuritis;
c) anemia;
d) ossification disorders.

18. Specify the signs corresponding to vitamin D deficiency:

Variants of answer:

a) rickets;
b) osteomalacia;
c) delayed closure of fontanelle;
d) muscular weakness;
e) inflammation of tongue and lips;
f) violation of synthesis of blood clotting factors.

19. Describe which changes in metabolism are correspond to excess of vitamin D:

Variants of answer:

a) hypercalcemia;
b) hyperphosphatemia;
c) hypocalcemia;
d) hypophosphatemia;
e) activation of lipid peroxidation;
f) formation and deposition of calcium phosphate.

20. Describe which changes accompanied by deficiency of vitamin E:

Variants of answer:

a) inhibition of redox reactions;
b) violation of bone mineralization;
c) violation of synthesis of blood clotting factors;
d) development of sterility;
e) increase in excitability of nerve tissue.

21. Describe which changes accompanied by deficiency of vitamin K:

Variants of answer:

a) inhibition of redox reactions;

b) violation of bone mineralization;
c) violation of synthesis of blood clotting factors;
d) development of sterility;
e) increase in excitability of nerve tissue.

22. Cheilosis develops as a result of:
Variants of answer:
a) a vitamin D deficiency;
b) a vitamin A deficiency;
c) a vitamin C deficiency;
d) a riboflavin deficiency.

23. Specify the signs corresponding to vitamin B_2 deficiency:
Variants of answer:
a) rickets;
b) osteomalacia;
c) photophobia;
d) muscular weakness;
e) inflammation of tongue and lips;
f) delayed closure of fontanelle.

24. Vitamin B_6 deficiency is accompanied by:
Variants of answer:
a) inhibition of redox reactions;
b) violation of bone mineralization;
c) violation of synthesis of blood clotting factors;
d) development of sterility;
e) increase in excitability of nerve tissue.

25. Vitamin C deficiency is accompanied by:
Variants of answer:
a) inhibition of redox reactions;
b) violation of bone mineralization;
c) violation of synthesis of blood clotting factors;
d) development of sterility;
e) increase in excitability of nerve tissue.

26. Deposition of urate in tissues is contributed:
Variants of answer:
a) acidosis;
b) alkalosis;
c) high temperature;
d) low temperature;
e) hypoxia.

27. Hyperuricemia is caused by:
Variants of answer:
a) increased content of fluoride in water;
b) increased content of iron in the body;
c) lead poisoning;
d) starvation;
e) acidosis.

DISORDERS OF CARBOHYDRATE AND LIPID METABOLISMS

Indicate all correct answers

1. Specify the typical form of carbohydrate metabolism disorders:
Variants of answer:
a) diabetes mellitus;
b) alimentary hyperglycemia;
c) hyperglycemia;
d) hypoglycemia;
e) renal diabetes;
f) hexosuria;
g) diabetic coma;
h) glycogen storage disease.

2. Violation of intermediate metabolism of carbohydrates leads to increased formation of:
Variants of answer:
a) α-ketoglutaric acid;
b) β-hydroxybutyric acid;
c) pyruvic acid;
d) arachidonic acid;
e) lactic acid;
f) ketone bodies.

3. Identifying the factors causing hypoglycemia:
Variants of answer:
a) predominance of inhibitory processes in CNS;
b)predominance of excitation processes in CNS;
c) consumption of large amounts of carbohydrates from food;
d) limiting of carbohydrate intake with food;
e) increase in activity of sympathetic nervous system;
f) decrease in activity of sympathetic nervous system.

4. Identifying the factors causing hyperglycemia:
Variants of answer:
a) predominance of inhibitory processes in CNS;
b) predominance of excitation processes in CNS;
c) consumption of large amounts of carbohydrates from food;
d) limiting of carbohydrate intake with food;
e) increase in activity of sympathetic nervous system;
f) decrease in activity of sympathetic nervous system.

5. Excess of which hormones can cause hyperglycemia?
Variants of answer:
a) epinephrine;
b) thyroid hormone (T_3, T_4);
c) glucocorticoids;
d) somatotropin;
e) insulin;
f) vasopressin;
g) glucagon.

6. The hyperinsulinism is characterized by:
Variants of answer:
a) inhibition of glucose transport across cell membranes;
b) activation of glucose transport across cell membranes;
c) activation of glycogenogenesis;
d) inhibition of glycogenolysis;
e) retarding of glucose oxidation;
f) activation of glucose oxidation.

7. Glycosuria is observed at:
Variants of answer:
a) diabetes mellitus;
b) diabetes insipidus;
c) hyperosmolar diabetic coma;
d) hyperlipidemia;
e) hyperlactacidemia.

8. Specify the possible causes of relative hypoinsulinism:
Variants of answer:
a) decrease in formation and release of insulin from the pancreas;
b) decreased sensitivity of tissues to insulin;
c) lack of somatotropin;
d) chronic excess of somatotropin;
e) chronic excess of adrenaline;
f) longterm excessive intake of carbohydrates from food.

9. The diabetes mellitus is characterized by:

Variants of answer:

a) increased protein synthesis in the body;
b) decreased protein synthesis in the body;
c) increase in glycogen storage in liver;
d) inhibition of glycogen storage in liver;
e) intensification of glycolysis, pentose cycle;
f) inhibition of glycolysis, pentose cycle;
g) stimulation of lipolysis.

10. What factors that cause the development of diabetes are outside the pancreatic?

Variants of answer:

a) increased connection of insulin to transporting proteins in the blood;
b) decreased connection of insulin to transporting proteins in the blood;
c) increased sensitivity of tissues to insulin;
d) decreased sensitivity of tissues to insulin;
e) decrease in activity of insulinase;
f) increase in activity of insulinase;
g) increased production of contrainsular hormones.

11. Specify the reason of polyuria in early stage of diabetes mellitus:

Variants of answer:

a) renal microangiopathy;
b) hyperglycemia;
c) ketonemia;
d) hypercholesterolemia.

12. Choose the most characteristic manifestations of protein metabolism disorders in diabetes mellitus:

Variants of answer:

a) positive nitrogen balance;
b) negative nitrogen balance;
c) increased gluconeogenesis;
d) weakening gluconeogenesis;
e) increased amino acids in blood;
f) decreased amino acids in blood.

13. Choose the most characteristic manifestations of lipid metabolism disorders in diabetes mellitus:

Variants of answer:

a) intensification of lipolysis;
b) inhibition of lipolysis;
c) fatty liver;

d) inhibition of lipogenesis;
e) intensification of lipogenesis;
f) increased ketogenesis.

14. Violation of carbohydrate metabolism in diabetes mellitus is characterized by:

Variants of answer:

a) decrease in glycogenogenesis in liver;
b) increased gluconeogenesis;
c) violation of glucose utilization by cells;
d) decrease of lactate and pyruvate concentration in blood;
e) decrease in gluconeogenesis.

15. Specify complications of long-term diabetes mellitus:

Variants of answer:

a) immunodeficiency;
b) accelerated development of atherosclerosis;
c) decrease in resistance to infections;
d) decrease in antitumor resistance;
e) microangiopathy;
f) macroangiopathy.

16. The basic link in pathogenesis of diabetic coma in a patient with type 1 diabetes is:

Variants of answer:

a) hypernatremia;
b) hyperglycemia;
c) hyperketonemia;
d) hyperkalemia.

17. Ketosis in diabetes mellitus is caused by:

Variants of answer:

a) activation of lipolysis;
b) decrease in renal excretion of ketone bodies;
c) increased production of ketone bodies;
d) nsufficient utilization of ketone bodies;
e) violation of oxidation of ketone bodies in Krebs cycle.

18. Main links in pathogenesis of diabetic hyperosmolar coma are:

Variants of answer:

a) pronounced hypernatremia;
b) pronounced hyperglycemia;
c) uncompensated ketoacidosis;
d) significant hyperkalemia;

e) hyperosmia of cells hyaloplasm;
f) hyperosmia of blood and interstitial fluid.

19. The main pathogenetic link of hypoglycemic coma is:
Variants of answer:
a) carbohydrate and energy "starvation" of brain neurons;
b) carbohydrate "starvation" of myocardium;
c) hyposmia of blood;
d) uncompensated ketoacidosis.

20. Development of diabetic angiopathy is contributed:
Variants of answer:
a) excessive glycosylation of proteins;
b) hyperlipidemia;
c) dyslipoproteinemia;
d) excess accumulation of sorbitol in vascular walls;
e) intensification of glycogenogenesis in vascular cells.

21. Specify the possible causes of pentosuria:
Variants of answer:
a) enhanced catabolism of higher fatty acids;
b) intensification of protein catabolism;
c) disorders of nucleic acid metabolism;
d) hyperpentosemia;
e) enzymopathies of renal glomeruli cells;
f) decrease in pentos reabsorption in the renal tubules.

22. What are the possible causes of glycogen storage disease?
Variants of answer:
a) alimentary hyperglycemia;
b) repression of genes encoding synthesis of glycogenolysis enzymes;
c) violation of glycogen synthesis from glucose in liver;
d) violation of glucose excretion by the kidneys;
e) mutation of genes encoding synthesis of glycogenolysis enzymes;
f) low activity of glycogen synthetase.

23. Hypolipoproteinemia can be caused by:
Variants of answer:
a) mutation of gene encoding apoLP A;
b) decrease in activity of plasma LPLase;
c) mutation of gene encoding apoLP B;
d) liver damage with development of liver failure;
e) deficiency of thyroid hormone production;
f) diet lean fats.

24. Congenital deficiency LPLase is accompanied by:
Variants of answer:
a) violation of conversion of chylomicron in remnant particles;
b) violation of conversion of VLDL in remnant particles;
c) hyperlipidemia;
d) hypolipidemia;
e) violation of transition of HDL to LDL;
f) violation of transition of VLDL to LDL;
g) sharp activation of atherogenesis.

25. Specify the possible causes and mechanisms of hyperlipoproteinemia:
Variants of answer:
a) pathology of receptor for LDL;
b) insufficient activity of adipocyte triglyceride lipase;
c) mutation of gene encoding apoLP E;
d) decrease in activity of plasma LPLase;
e) increased production of lipocalin by pancreatic cells;
f) excessive release of glucagon into the bloodstream;
g) liver failure with severe cholehemia;
h) mutation of gene encoding apoLP A, in which the apoproteins are not synthesized.

26. Specify the risk factors for atherosclerosis:
Variants of answer:
a) hypoinsulinism;
b) hypercholesterolemia;
c) hyperlipidemia;
d) glycogen storage disease;
e) arterial hypertension;
f) chronic damage of vascular wall.

27. The development of atherosclerosis in obesity is contributed:
Variants of answer:
a) hypercholesterolemia;
b) hyperglycemia;
c) polyuria;
d) polydipsia;
e) hypertriglyceridaemia;
f) dyslipoproteinemia.

28. The development of atherosclerosis in diabetes mellitus is contributed:
Variants of answer:
a) excess of accumulation sorbitol in vascular walls;
b) accumulation of glycogen in muscle cells of vascular walls;

c) excessive protein glycosylation of vascular wall;
d) dyslipoproteinemia;
e) hypercholesterolemia;
f) hyperlipidemia.

29. Macrophages absorb LP with the participation of the following receptors:

Variants of answer:
a) receptor for LDL;
b) scavenger receptors;
c) receptor for cholesterol;
d) receptor for VLDL;
e) receptor for phospholipids.

30. Scavenger receptors are provided for contact with:

Variants of answer:
a) glycosylated lipoprotein;
b) LDL all modifications;
c) desialylated lipoprotein;
d) lipoproteins resulting from peroxidation.

31. The basis of LP modification can lay the following processes:

Variants of answer:
a) glycosylation
b) formation of antibodies against apoLP;
c) activation of lipid peroxidation;
d) formation of a complex with glycosaminoglycans of intercellular substance;
e) splitting of lipids under the action of triglyceride lipase;
f) partial proteolysis of apoLP;
g) etherification of cholesterol.

32. The most common consequences and complications of atherosclerosis are:

Variants of answer:
a) aneurysms of aorta and large arteries;
b) vasospasm;
c) ischemic heart disease;
d) arterial thrombosis;
e) vein thrombosis;
f) thromboembolism;
g) stroke.

33. List the hormones that stimulate mobilization of fat from fat depots:

Variants of answer:
a) adrenaline;

b) somatotropin;
c) glucocorticoids;
d) thyroxine;
e) calcitonin;
f) aldosterone.

34. Name the main etiological factors of obesity:
Variants of answer:
a) starvation;
b) hypodynamia;
c) hypercortisolism;
d) hyperthyroidism;
e) hypogonadism;
f) somatotropin deficiency;
g) damage to the ventromedial nucleus of hypothalamus, accompanied by polyphages.

35. Obesity develops at:
Variants of answer:
a) Cushing's syndrome;
b) myxedema;
c) hyperthyroidism;
d) aldosteronism;
e) lipotropic pituitary hormone deficiency.

36. Negative effects of obesity are:
Variants of answer:
a) acceleration of atherogenesis;
b) digestive disorders;
c) increased risk of diabetes mellitus;
d) increased risk of hypertension;
e) fatty liver;
f) weakness of skeletal muscles.

DISORDERS OF ACID BASE BALANCE, WATER ELECTROLYTE AND MINERAL METABOLISM

Indicate all correct answers

1. What indicators are used to evaluate ABC?
Variants of answer:
a) buffer base;
b) excess (or deficit) of bases;
c) oxygen saturation of venous blood;
d) standard bicarbonates;
e) clearance of insulin;
f) erythrocyte sedimentation rate.

2. Main buffer systems of the body are:
Variants of answer:
a) bicarbonate;
b) acetate;
c) phosphate;
d) ammonium;
e) protein
f) hemoglobin.

3. Alveolar hypoventilation can lead to:
Variants of answer:
a) mixed acidosis;
b) metabolic alkalosis;
c) respiratory acidosis;
d) respiratory alkalosis.

4. Base deficit (BE) is characteristic for:
Variants of answer:
a) metabolic acidosis;
b) respiratory acidosis;
c) metabolic alkalosis;
d) + compensated respiratory alkalosis.

5. Specify renal compensation mechanisms for ABC shifts:
Variants of answer:
a) glycogen resynthesis from lactic acid;
b) excretion of acidic and alkaline compounds;
c) potassiumsodium ion exchange mechanism;
d) acidogenesis;
e) ammoniogenesis;
f) reabsorption of amino acids.

6. Specify the reasons leading to the development of respiratory acidosis:

Variants of answer:

a) renal pathology;

b) pulmonary hypoventilation;

c) long-term use with food "acidic" products;

d) high concentration of CO_2 in the environment;

e) decrease in pO_2 in air;

f) diabetes mellitus;

g) accumulation of exudate in the pleural cavity.

7. The compensation of respiratory acidosis are involved the following processes:

Variants of answer:

a) activation of acido and ammoniogenesis in the kidneys;

b) increase in bicarbonate reabsorption in the kidneys;

c) decrease in bicarbonate reabsorption in the kidneys;

d) binding of excess H^+ protons by haemoglobin;

e) release from protein of H^+ions in exchange for Na^+ and K^+ ions;

f) release from protein of Na^+ and K^+ ions in exchange for H^+ ions.

8. Compensated respiratory acidosis is characterized by:

Variants of answer:

a) excess of bases (BE+);

b) deficit of bases (BE-);

c) increase of standard bicarbonate (SB);

d) decrease of standard bicarbonate (SB);

e) increase in arterial pCO_2;

f) decrease in arterial pCO_2.

9. Uncompensated respiratory acidosis is characterized by:

Variants of answer:

a) decrease in arterial blood pH;

b) increase in blood pCO_2;

c) low concentration of bicarbonate in plasma;

d) diffusion of chloride ions from erythrocytes into the extracellular fluid;

e) increase in titratable acidity of urine.

10. Severe hypercapnia during respiratory acidosis leads to:

Variants of answer:

a) spasm of arterioles;

b) dilatation of arterioles;

c) bronchospasm;

d) bronchodilation;

e) increase in blood pressure;

f) decrease in blood pressure.

11. Specify the causes nonrespiratory acidosis:
Variants of answer:
a) increase in intake of volatile acids from outside;
b) alveolar hypoventilation;
c) excessive formation of acidic metabolic products;
d) loss of a large amount of intestinal juice;
e) insufficient secretion of acidic metabolites by kidneys;
f) metabolic disorders, accompanied by the accumulation of organic acids.

12. Metabolic acidosis develops at:
Variants of answer:
a) diabetes mellitus;
b) renal failure;
c) extensive burns, injuries;
d) pulmonary hyperventilation;
e) inhibition of respiratory center;
f) starvation;
g) hypoxia.

13. Compensatory reactions of the organism at a metabolic acidosis are:
Variants of answer:
a) hydrogen ion binding by proteins;
b) exchange of hydrogen ions for potassium and calcium ions of cells;
c) increased bicarbonate excretion by kidneys into the urine;
d) increase in urinary excretion of ammonium chloride;
e) alveolar hypoventilation;
f) alveolar hyperventilation.

14. Compensated metabolic acidosis is characterized by:
Variants of answer:
a) low blood pH;
b) low concentration of bicarbonate in plasma;
c) compensatory decrease in blood pCO_2;
d) weakening of ammoniogenesis in the kidneys;
e) increase in titratable acidity of urine.

15. Compensated metabolic acidosis is observed:
Variants of answer:
a) hyperventilation;
b) hypoventilation;
c) increase in vascular tone;
d) decrease in vascular tone;
e) increase in neuromuscular excitability;
f) decrease in neuromuscular excitability.

16. Causes of respiratory alkalosis are:

Variants of answer:

a) increase in the excitability of respiratory center;

b) inhale air with decreasing pO_2 (during the ascent to high);

c) chronic circulatory failure;

d) pulmonary hyperventilation at artificial respiration;

e) pulmonary hypoventilation;

f) pulmonary hyperventilation at irritation of respiratory center.

17. Respiratory alkalosis is characterized by:

Variants of answer:

a) increase in blood pH;

b) decrease in blood pCO_2;

c) pulmonary hyperventilation;

d) increase in concentration of bicarbonate in plasma;

e) decrease in titratable acidity of urine.

18. Which of processes involved in compensation of respiratory alkalosis?

Variants of answer:

a) pulmonary hyperventilation;

b) binding of cations by protein buffer with release of H^+ ions;

c) output of H^+ions in blood from the cells with exchange for K^+ ions;

d) increased excretion of HCO_3 in the urine;

e) decrease in bicarbonate reabsorption in the kidneys;

f) increase in hydrogen-carbonate reabsorption in the renal tubules.

19. Compensation of disturbed acidbase status in respiratory alkalosis is performed by:

Variants of answer:

a) increase in alveolar ventilation;

b) increase in renal excretion of bicarbonate4

c) excretion of hydrogen and chlorine ions from the cells into the extracellular fluid;

d) increase in production of lactic acid.

20. Compensated respiratory alkalosis is characterized by:

Variants of answer:

a) excess of bases (BE+);

b) deficit of bases (BE-);

c) slight increase in standard bicarbonate (SB);

d) slight decrease in standard bicarbonate (SB);

e) increase in arterial pCO_2;

f) decrease in arterial pCO_2.

21. Dehydration at a respiratory alkalosis is developed due to:
Variants of answer:
a) excretion of sodium and potassium from the body;
b) retention of sodium and potassium in the body;
c) decrease in osmotic pressure;
d) increase in osmotic pressure.

22. Specify the causes nonrespiratory alkalosis:
Variants of answer:
a) excessive intake of alkalis;
b) alveolar hyperventilation;
c) significant loss of gastric juice;
d) overproduction (excess administration) of mineralocorticoids;
e) insufficient excretion of bases by kidneys.

23. The factors that lead to the development of nonrespiratory alkalosis include:
Variants of answer:
a) hypovolemia;
b) hypokalemia;
c) hypoaldosteronism;
d) excess of glucocorticoids;
e) long-term use of diuretics (furosemide).

24. Specify the reasons leading to the development of metabolic alkalosis:
Variants of answer:
a) pyloric stenosis;
b) diabetes mellitus;
c) hypersecretion of mineralocorticoids and glucocorticoids;
d) myocardial infarction;
e) administering a large amount of alkalis;
f) excitation of respiratory center;
g) decrease in secretion of mineralocorticoids and glucocorticoids.

25. Metabolic alkalosis is characterized by:
Variants of answer:
a) increase in blood pH;
b) increase in concentration of bicarbonate in plasma;
c) compensatory decrease in blood pCO_2;
d) weakening of ammoniogenesis in the kidneys;
e) decrease in titratable acidity of urine.

26. The metabolic alkalosis is characterized by:
Variants of answer:
a) excess of bases (BE+);

b) deficit of bases (BE-);
c) increase of standard bicarbonate (SB);
d) decrease of standard bicarbonate (SB).

27. Tetany is characterized by the development of disorders of acid-base status as:

Variants of answer:
a) metabolic acidosis;
b) metabolic alkalosis;
c) respiratory acidosis;
d) respiratory alkalosis.

28. Violations of water balance in the body can be caused by deficiency or excess of:

Variants of answer:
a) T_4;
b) adrenaline;
c) oxytocin;
d) vasopressin;
e) aldosterone;
f) insulin;
g) melanocyte stimulating hormone.

29. Specify changes conditional on the development of edema:

Variants of answer:
a) increase in oncotic pressure of blood;
b) increase in oncotic pressure of interstitial fluid;
c) increase in osmotic pressure of interstitial fluid;
d) increase in venous pressure;
e) decrease in venous pressure.

30. Specify the types of edema in the pathogenesis of which the leading role belongs to the oncotic factor:

Variants of answer:
a) during starvation;
b) swelling Kwinke;
c) in inflammation;
d) in nephrotic syndrome;
e) liver failure.

31. Specify the types of edema in the pathogenesis of which the leading role belongs to the increased permeability of vascular wall:

Variants of answer:
a) heart failure;
b) swelling Kwinke;
c) liver failure;

d) at bee stings;
e) in inflammation.

32. The reasons that lead to the development of a hyperosmolar dehydration are:

Variants of answer:
a) limitation of water intake;
b) vomiting and diarrhea;
c) diabetes insipidus;
d) hyperaldosteronism;
e) loss of fluid through the lungs during hyperventilation.

33. The reasons that lead to the development of a hypoosmolar dehydration are:

Variants of answer:
a) limitation of water intake;
b) vomiting and diarrhea;
c) diabetes mellitus;
d) loss of fluid through the lungs during hyperventilation;
e) loss of fluid through the skin during sweating.

34. The reasons that lead to the development of a hyperosmolar hyperhydration are:

Variants of answer:
a) excessive injection of hypertonic solutions in the body;
b) secondary aldosteronism;
c) limitation of water intake;
d) drinking of sea water;
e) excess of antidiuretic hormone.

35. Hypervolemic hypotonic hyponatremia develops:

Variants of answer:
a) in the oliguric phase of acute renal failure;
b) in severe hypothyroidism;
c) at taking of thiazide diuretics;
d) in primary psychogenic polydipsia;
e) during antidiuretic hormone hypersecretion.

36. Copper deficiency in the body is manifested:

Variants of answer:
a) development of macrocytic anemia and leukocytosis;
b) connective tissue defects;
c) skin depigmentation;
d) development of microcytic anemia and leukopenia;
e) polycystic kidney disease.

HYPOXIA

Indicate all correct answers

1. Possible reasons for reducing the oxygen capacity of blood are:
Variants of answer:
a) polycythemic hypovolemia;
b) oligocythemic hypervolemia;
c) formation of carboxyhemoglobin;
d) formation of methemoglobin;
e) decrease in PaO_2;
f) anemia.

2. In pathogenesis of hypoxic cell damage a leading role play:
Variants of answer:
a) inhibition of glycolysis;
b) mobilization of creatine phosphate;
c) increase of sodium in cell;
d) activation of phospholipase A_2;
e) release of lysosomal enzymes;
f) accumulation of Ca^{2+} in mitochondria.

3. Specify causes for hypoxia exogenous type:
Variants of answer:
a) hypovitaminosis B_{12};
b) altitude sickness;
c) cyanide poisoning;
d) carbon monoxide poisoning;
e) mountain sickness.

4. Specify changes in blood that are typical for the initial phase of exogenous hypobaric hypoxia:
Variants of answer:
a) hypercapnia;
b) hypocapnia;
c) hypoxemia;
d) respiratory alkalosis;
e) respiratory acidosis.

5. Which of the following factors cause cell damage in normo- and hyperbaric hyperoxygenation:
Variants of answer:
a) hypercapnia;
b) hypocapnia;
c) excess of reactive oxygen species in cells;

d) excess of radicals and lipid peroxide compounds in cells;
e) excess of potassium ions in cytoplasm.

6. Specify causes for hypoxia respiratory type:
Variants of answer:
a) decrease in pO_2 in air;
b) carbon monoxide poisoning;
c) lung emphysema;
d) poisoning by nitrates;
e) mitral valve insufficiency;
f) decrease in excitability of respiratory center.

7. Specify causes for hypoxia circulatory type:
Variants of answer:
a) traumatic shock;
b) acute massive blood loss;
c) pulmonary arterial hypertension;
d) myocarditis;
e) poisoning by nitrates;
f) uncomplicated myocardial infarction.

8. Hypoxia circulatory type is characterized by:
Variants of answer:
a) decrease in linear blood flow velocity;
b) decrease of arteriovenous oxygen difference;
c) reduction of oxygen content in arterial blood;
d) decrease in volumetric velocity of capillary blood flow;
e) increase of arteriovenous oxygen difference;
f) acidosis.

9. How gas composition and blood pH changes in typical cases of circulatory hypoxia:
Variants of answer:
a) arterial-venous oxygen difference increased;
b) arterial-venous oxygen difference decreased;
c) Pa oxygen decreased;
d) Pa oxygen does not change;
e) Pv oxygen increased;
f) Pv oxygen decreased;
g) pH decreased;
h) pH increased.

10. Specify causes for hypoxia hemic type:
Variants of answer:
a) carbon monoxide poisoning;

b) poisoning by nitrates;
c) chronic blood loss;
d) lung emphysema;
e) mitral valve insufficiency;
f) hypovitaminosis B_{12}.

11. The affinity of hemoglobin for oxygen decreases at:
Variants of answer:
a) acidosis;
b) alkalosis;
c) hypercapnia;
d) hypocapnia.

12. Specify causes for hypoxia tissue type:
Variants of answer:
a) hypovitaminosis $B_{1;}$
b) hypovitaminosis PP;
c) hypovitaminosis $B_{12;}$
d) cyanide poisoning;
e) carbon monoxide poisoning;
f) mountain sickness.

13. Specify causes for hypoxia tissue type:
Variants of answer:
a) poisoning by methemoglobin formers;
b) cyanide poisoning;
c) acute blood loss;
d) decrease in activity of tissue respiration enzymes;
e) biooxidation enzyme deficiency in cells;
f) blockade of cytochrome enzymes in cells;
g) glucose deficiency in cells.

14. How does oxygen consumption of tissues change under the influence of biological oxidation uncouplers:
Variants of answer:
a) increases;
b) decreases;
c) no change.

15. Arteriovenous oxygen difference significantly decreases during hypoxia:
Variants of answer:
a) hypoxic;
b) respiratory;

c) hemic;
d) circulatory;
e) tissue.

16. Specify causes for hypoxia mixed type:
Variants of answer:
a) traumatic shock;
b) acute massive blood loss;
c) chronic blood loss;
d) pulmonary arterial hypertension;
e) myocarditis;
f) poisoning by nitrates.

17. Mechanisms of compensation in acute hypoxia are:
Variants of answer:
a) increase in pulmonary ventilation;
b) redistribution of blood;
c) tachycardia;
d) release of RBCs from depot;
e) increase in number of mitochondria in cell;
f) intensification of anaerobic glycolysis;
g) decrease in oxyhemoglobin dissociation.

18. What changes in the cell may be considered as compensatory in hypoxia:
Variants of answer:
a) activation of glycolysis;
b) activation of lipid peroxidation;
c) activation of phospholipase A2;
d) mobilization of creatine phosphate;
e) mobilization of glycogen;
f) increase of sodium in cell.

19. What changes occur in the body during acute hypoxia in the compensation stage:
Variants of answer:
a) tachycardia;
b) tachypnea;
c) hyperpnea;
d) increase in hematocrit;
e) coronary vasospasm;
f) muscle vasodilation;
g) brain vasodilation.

20. Specify mechanisms leading to increased oxygen capacity of blood at a moderate repeated hypoxia:

Variants of answer:

a) acceleration of erythrocytes output from bone marrow into the blood;
b) increasing production of erythropoietin;
c) increasing the number of RBCs in blood;
d) increase in cardiac output;
e) increasing the volume of alveolar ventilation;
f) increasing the permeability of airblood barrier to oxygen.

EXTREME CONDITIONS

Indicate all correct answers

1. Specify the conditions that relate to the extreme:

Variants of answer:

a) immunodeficiency;
b) diabetic coma;
c) traumatic shock;
d) hyperhydration;
e) hypervolemia;
f) collapse.

2. Specify the leading links in pathogenesis of shock:

Variants of answer:

a) decrease in circulating blood volume;
b) decrease in release of catecholamines;
c) increase in vascular permeability;
d) peripheral tissue hypoxia;
e) secretion of biologically active substances from ischemic tissue in blood;
f) increase in venous return to the heart.

3. Specify changes in the microcirculatory bed in shock:

Variants of answer:

a) increased tone of arterioles and precapillary sphincters;
b) increase in vascular permeability;
c) decreased tone of venules;
d) speed reduction of capillary blood flow.

4. Select manifestations that characterize the erectile phase of shock:

Variants of answer:

a) activation of sympathoadrenal system;
b) arterial hypotension;

c) motor and speech excitation;
d) confusion of the patient;
e) pulmonary hyperventilation;
f) reduction in cardiac output;
g) hyperreflexia.

5. Select manifestations that characterize the torpid phase of shock:
Variants of answer:
a) activation of sympathoadrenal system;
b) decreasing activity of sympathoadrenal system;
c) motor and speech excitation;
d) tachycardia, arterial hypertension;
e) reduction in cardiac output;
f) deposit of blood;
g) arterial hypoxemia;
h) oliguria.

6. The most common complication of traumatic shock in patients with multiple injuries is:
Variants of answer:
a) fat embolism;
b) traumatic rhabdomyolysis;
c) infection.

7. Identifying the factors of toxemia in traumatic shock:
Variants of answer:
a) excess of histamine, acetylcholine;
b) products of denaturation and hydrolysis of protein;
c) excess of lysosomal enzymes;
d) excess of POL products;
e) hypernatremia;
f) hyperkalemia;
g) hyperglycemia.

8. Leading link in the pathogenesis in cardiogenic shock is:
Variants of answer:
a) weakening of the heart pumping function;
b) decrease in blood volume;
c) fall of vascular tone.

9. Which of the following hemodynamic parameters are correspond to cardiogenic shock:
Variants of answer:
a) low blood pressure;

b) low cardiac output;
c) low pressure in the right atrium;
d) high pressure in the right atrium.

10. Which of the following hemodynamic parameters are correspond to hypovolemic shock:

Variants of answer:
a) low blood pressure;
b) low cardiac output;
c) low pressure in the right atrium;
d) high pressure in the right atrium.

11. Septic shock is characterized by:

Variants of answer:
a) increase in cardiac output;
b) increase in blood pressure;
c) tachycardia;
d) increasing the number of Leukocyte in blood;
e) increase in TPVR;
f) decrease in TPVR.

12. Specify the possible causes and mechanisms of collapse:

Variants of answer:
a) widespread arteriolo-venular shunting of blood;
b) decrease in venous return;
c) reduction in cardiac output;
d) polycythemic hypervolemia;
e) hypocorticism;
f) hypoxia.

13. Specify types of the collapse by mechanisms of its development:

Variants of answer:
a) vasodilated;
b) hypervolemic;
c) hypovolemic;
d) vasoconstricted;
e) cardiogenic.

14. What changes are characteristic of "cardiogenic" collapse?

Variants of answer:
a) reduction in stroke and minute heart ejection;
b) increase in blood pressure;
c) decrease in blood pressure;

d) redistribution of blood;
e) decrease in blood circulating volume.

15. Causes of coma can be:
Variants of answer:
a) autointoxication by products of metabolism and decay substances;
b) deficiency of essential metabolic substrates;
c) normosmolarity hypervolemia;
d) extracellular hyperhydration;
e) exogenous intoxication;
f) hypoxia;
g) endocrinopathies.

16. What changes are characteristic of coma?
Variants of answer:
a) + activation of sympathoadrenal system;
b) inhibition of sympathoadrenal system;
c) + loss of consciousness;
d) + hyporeflexia, areflexia;
e) hyperreflexia.

17. The response in stress depends on:
Variants of answer:
a) nature of the stressor;
b) forces of the stressor;
c) duration of the stressor;
d) frequency of the stressor action.

18. Which of these factors contribute to the development of stress:
Variants of answer:
a) activation of opioid system;
b) activation of serotonergic system;
c) activation of sympathoadrenal system;
d) increase in secretion of corticoliberin by hypothalamus;
e) increase in secretion of ACTH by basophil cells of pituitary gland;
f) increase in formation of prostaglandins in the tissues.

19. The first in the stress response is activated:
Variants of answer:
a) hypothalamic-pituitary-adrenal system;
b) sympathetic nervous system;
c) opioid system.

20. What is the effect of opioid peptides on the sympathetic nervous system in stress?

Variants of answer:

a) activate it;

b) limit its activity;

c) inhibit output of norepinephrine from synapses;

d) stimulate output of norepinephrine from synapses;

e) inhibit the interaction of neurons with norepinephrine;

f) activate the interaction of neurons with norepinephrine.

21. The content of what hormones are increased in blood during stress reactions?

Variants of answer:

a) ACTH;

b) insulin;

c) thyroid hormones;

d) glucocorticoids;

e) epinephrine;

f) androgens.

22. Increasing nonspecific resistance in stress is due to:

Variants of answer:

a) mobilization and redistribution of energy resources;

b) increasing the power and stability of the ion pumps;

c) stabilization of cell membranes;

d) decreasing activity of sympathoadrenal system.

23. Specify the most typical consequences that are characteristic of prolonged stress:

Variants of answer:

a) hypo and dystrophy of adrenal cortex;

b) suppression of humoral and cellular links of immunity;

c) ulcers and erosions of gastric and intestine mucosa;

d) anemias;

e) arterial hypertension;

f) neurosis;

g) pollen allergy.

24. Specify the manifestations that are characteristic of severe prolonged stress:

Variants of answer:

a) development of ulcers in gastrointestinal tract;

b) reducing the size of thymus and lymph nodes;

c) adrenal hyperplasia;

d) neutrophilia and erythrocytosis;
e) hypoglycaemia.

25. Which of the following factors play a significant role in the pathogenesis of coronary heart disease in stress?

Variants of answer:

a) activation of lipid peroxidation in myocardiocytes;
b) stabilization of lysosomal membranes;
c) excess of cytoplasmic Ca^{2+} in myocardiocytes;
d) hypercatecholaminemia;
e) intensification of fibrinolysis.

26. Identifying the factors that play a significant role in the formation of hypertension in chronic stress:

Variants of answer:

a) activation of sympathoadrenal system;
b) increased sensitivity of baroreceptors in carotid sinus and aortic areas to increased blood pressure;
c) low level of blood sodium;
d) increasing the concentration of cortisol in blood.

27. Which of the following factors play a significant role in the pathogenesis of gastric ulcers in stress?

Variants of answer:

a) increase in vagal tone;
b) increase in secretion of gastric juice;
c) increase in synthesis of PgE_2 by gastric epithelial cells;
d) increase in vascular permeability;
e) attenuation of epithelial regeneration.

28. In what stage of the general adaptation syndrome develops hypertrophy of the adrenal cortex?

Variants of answer:

a) in alarm stage;
b) in resistance stage;
c) in exhaustion stage.

29. First stage of general adaptation syndrome is characterized by:

Variants of answer:

a) reducing the size of thymus and lymph nodes;
b) increasing the size of thymus and lymph nodes;
c) depletion of the adrenal cortex;
d) activation of adrenal cortex.

30. Resistance stage of general adaptation syndrome is characterized by:
Variants of answer:
a) increased secretion of glucocorticoids;
b) decreased secretion of glucocorticoids;
c) increased gluconeogenesis;
d) weakening gluconeogenesis;
e) neutrophilic leukocytosis;
f)absolute lymphocytosis.

31. The main stress-limiting systems are:
Variants of answer:
a) complement system;
b) opioid peptides system;
c) serotonergic system;
d) GABA-ergic system;
e) fibrinolytic system;
f) antioxidant systems.

32. Increase in the level of opioid peptides in stress lead to:
Variants of answer:
a) decrease in pain sensitivity;
b) increase in pain sensitivity;
c) hyperthermia;
d) hypothermia.

33. Which of these factors hinder to the development of stress:
Variants of answer:
a) activation of opioid system;
b) activation of serotonergic system;
c) activation of GABAergic system;
d) activation of sympathoadrenal system;
e) increase in secretion of corticoliberin by hypothalamus;
f) increase in formation of prostaglandins in the tissues;
g) hyperproduction of ACTH by basophil cells of pituitary gland.

PATHOLOGY OF TISSUE GROWTH. TUMORS

Indicate all correct answers

1. Specify typical forms of tissue growth pathology:

Variants of answer:

a) pathological hypertrophy;
b) pathological hypotrophy;
c) dysplasia;
d) tissue necrosis;
e) hyperplasia of mitochondria;
f) sarcoma;
g) tumor growth.

2. Pathological tissue hypertrophy is:

Variants of answer:

a) increasing mass and volume of structural elements after completion of formation of organs and tissues;

b) increasing mass and volume of structural elements of organs and tissues after excessive exercise;

c) increasing mass and volume of structural elements of organs and tissues inadequate to their functions.

3. To dysplasia can lead:

Variants of answer:

a) violation of mitosis;
b) violation of meiosis;
c) violation of cell differentiation process;
d) violation of cell genetic program;
e) acute hyperglycemia;
f) extracellular acidosis.

4. Specify the state of increased cancer risk:

Variants of answer:

a) acute inflammatory processes;
b) chronic inflammatory processes;
c) aging;
d) immunodeficiency;
e) BCG vaccination.

5. Carcinogenesis resulting:

Variants of answer:

a) overexpression of normal genes that control cell division;
b) structural modification of DNA by the action of carcinogens;

c) inactivation of regulatory cytoplasmic proteins by carcinogens;
d) substitution of tissue cell respiration by glycolysis.

6. Possible mechanisms for transformation of normal cell into tumor are:
Variants of answer:
a) translocation of chromosome region;
b) amplification of protooncogenes;
c) polyploidy;
d) inactivation of antioncogenes;
e) tetrasomy.

7. Specify the cell most often subjected to malignancy:
Variants of answer:
a) skin epithelium;
b) mucosal epithelium;
c) vascular endothelium;
d) bone marrow cells;
e) connective tissue cells;
f) epithelium of female reproductive organs.

8. Specify the factors that stimulate cell division:
Variants of answer:
a) cAMP;
b) cGMP;
c) growth factors;
d) decrease in surface tension of cells;
e) chalones.

9. Specify the factors that inhibit cell division:
Variants of answer:
a) cAMP;
b) cGMP;
c) growth factors;
d) decrease in surface tension of cells;
e) chalones.

10. Increase in tumor incidence with age is due to:
Variants of answer:
a) decrease in immune surveillance;
b) inactivation of DNA repairase;
c) inhibition of nuclease barrier;
d) increase in chalones production in tissues.

11. The role of heredity in the occurrence of cancer is confirmed:

Variants of answer:

a) discordance of monozygotic twins for tumors;

b) more frequent incidence of tumors in people with chromosomal diseases;

c) concordance of monozygotic twins for tumors;

d) occurrence of "family" of tumors;

e) tumor immune atypia.

12. Name stages of tumor growth:

Variants of answer:

a) promotion;

b) cocarcinogenesis;

c) progression;

d) initiation;

e) procarcinogenesis.

13. Cocarcinogen is:

Variants of answer:

a) carcinogenic, acting together with another carcinogen;

b) RNA-oncovirus, acting together with another carcinogen;

c) factor that by itself does not cause tumors, but potentiates the action of true carcinogens.

14. Specify the most correct statement:

Variants of answer:

a) carcinogen is an agent that causes a tumor;

b) carcinogen is an chemical agent that causes a tumor;

c) carcinogen is a substance secreted by the tumor cells and facilitates their reproduction.

15. Specify true statement:

Variants of answer:

a) cell oncogene is viral oncogenic gene introduced into the cellular genome;

b) cell oncogene is a gene that controls cell division, introduced in normal cell from tumor;

c) cell oncogene is a cell gene controlling its division that turned into oncogenic gene in process of carcinogenesis.

16. Identifying the factors contributing to the implementation of carcinogenic agents' action on body cells:

Variants of answer:

a) action of cocarcinogen;

b) action of syncarcinogen;

c) action of antioxidants;

d) low activity of anticarcinogenic mechanisms of antitumor protection of organism;

e) activation of ant-carcinogenic mechanisms of antitumor protection of organism.

17. Mechanisms of protooncogenes activation are:

Variants of answer:

a) chromosome deletion;
b) translocation of chromosome region;
c) inclusion of viral DNA into the genome;
d) changes in activity of enzymes of fatty acids βoxidation;
e) doubling of nuclear DNA number during mitosis;
f) amplification of protooncogenes;
g) insertion of promoter.

18. For the term "oncoproteins" the following assertions hold:

Variants of answer:

a) cause tumors;
b) similar to fetoproteins;
c) synthesized on oncogenes;
d) cause a transition of genes in oncogenes;
e) cause malignant transformation of normal cells;
f) stimulate tumor progression.

19. Oncoproteins show properties:

Variants of answer:

a) growth factors;
b) growth factor receptors;
c) membrane G-protein;
d) chalones;
e) transmit growth signals on DNA.

20. Which of these endogenous substances can have a carcinogenic effect?

Variants of answer:

a) IgD;
b) complement component C3a;
c) indole;
d) POL products;
e) free radical.

21. Blastomogenic effect of steroid sex hormones may be associated with:

Variants of answer:

a) formation of carcinogenic metabolites;

b) increased proliferative activity of T-lymphocytes;
c) activation of proliferative processes in a hormone-dependent tissues.

22. Note substances belonging to exogenous carcinogens:
Variants of answer:
a) cortisol;
b) benzpyrene;
c) serotonin;
d) dimethylbenzantracene;
e) methylcholanthrene.

23. What cell structure is a target for chemical carcinogens?
Variants of answer:
a) cytoplasmic membrane;
b) sarcoplasmic reticulum;
c) molecules of intracellular matrix;
d) nuclear DNA;
e) lysosomes;
f) mitochondria.

24. The basis of viral blastomatosis are:
Variants of answer:
a) virus multiplies in the body's cells, causing their death;
b) virus causes excessive production of growth hormone by pituitary gland;
c) virus violates regulatory functions of the cell hereditary apparatus;
d) virus introduces additional genetic information, connecting with the cell genetic apparatus.

25. Malignant transformation can be carried out:
Variants of answer:
a) by mutation;
b) epigenomic;
c) under the influence of carcinogens;
d) only under the influence of mutagens.

26. The term "tumor progression" refers to:
Variants of answer:
a) increase in tumor mass;
b) constant emergence of more malignant cell clones;
c) tumor escape from the immune surveillance;
d) beginning of oncoproteins synthesis;
e) metastasis of tumor cells.

27. Tumor progression is characterized by:
Variants of answer:
a) increasing cells anaplasia;

b) loss of autonomy;
c) invasiveness;
d) infiltrative growth;
e) strengthening of processes of final cell differentiation;
f) strengthening of antigenic stimulation of the body by tumor cells.

28. What factors contribute to the metastasis of tumor cells:
Variants of answer:
a) high level of contact inhibition;
b) production of collagenase type 4 by tumor cells;
c) strengthening the forces of adhesion between tumor cells;
d) reduce the content of sialic acids in cytoplasmic membrane;
e) strengthening of expression of HLA-complex molecules;
f) "borrowing" of macrophage plasmin by tumor cells.

29. Select properties that characterize the tumor cells:
Variants of answer:
a) lack of contact inhibition when growth in culture;
b) strengthening the forces of adhesion between cells;
c) increasing the concentration of sialic acids on cell membrane;
d) increase in intracellular Ca^{2+};
e) reduction of cytoplasmic Ca^{2+};
f) high content of proteases on the cell surface;
g) phenomenon of "borrowing" of plasmin in macrophages.

30. Specify the features characteristic of benign tumors:
Variants of answer:
a) rapid formation of a tumor node;
b) expansive growth;
c) infiltrative growth;
d) recurrence;
e) relatively high degree of cell and functional differentiation;
f) high degree of tumor progression.

31. Specify manifestations of growth atypism of malignant tumors:
Variants of answer:
a) metastasis;
b) recurrence;
c) invasive growth;
d) expansive growth;
e) inhibition or block of cell maturation;
f) attenuation of cell contact inhibition properties.

32. Malignant tumor cells are characterized by changes in metabolism:
Variants of answer:
a) increase in glucose uptake;

b) attenuation of anaerobic glycolysis;
c) activation and qualitative changes in protein synthesis;
d) increase in capture of cholesterol and higher fatty acids;
e) hypohydration of tumor tissue;
f) activation of nucleic acid metabolism.

33. Malignant growth is characterized by:
Variants of answer:
a) attenuation of contact inhibition processes of cells in culture;
b) high content of chalones in tissues;
c) need for a solid support for growth of cells in culture;
d) intensification of anaerobic glycolysis;
e) products of factors enhancing angiogenesis in tissues;
f) attenuation of cell differentiation.

34. What is different in chemical composition of tumor tissue from normal?
Variants of answer:
a) higher water content;
b) lower water content;
c) higher potassium content;
d) lower potassium content;
e) higher proteins and nucleotides content;
g) lower proteins and nucleotides content.

35. What are metabolic features characteristic of tumor tissue?
Variants of answer:
a) activates glycolysis;
b) intensified tissue respiration;
c) accumulate oxidized products (lactic acid, etc.);
d) lactic acid content is reduced;
e) pH shift to the acid side.

36. Features of protein metabolism in the cells of malignant tumors are:
Variants of answer:
a) inhibition of protein synthesis;
b) activation protein synthesis;
c) predominance of protein catabolism;
d) possibility of fetoprotein synthesis.

37. What disorders of carbohydrate metabolism are observed in tumor disease?
Variants of answer:
a) inhibition of glucose uptake by tumor tissue;
b) increased glucose uptake by tumor;

c) intensified utilization of fatty acids and ketone bodies by tissue;
d) accumulation of lactic acid in the body;
e) strengthening of Pasteur effect.

38. Mechanisms antineoplastic resistance include:
Variants of answer:
a) antibody dependent cellular cytotoxicity;
b) presence in the human genome of antioncoproteins;
c) presence of DNA repair system;
d) reduction of lymphocyte cytotoxicity;
e) effects of TNF;
f) lymphokine-induced activation of lymphocytes.

39. What factors are aimed at destruction of tumor cells in the body?
Variants of answer:
a) fibrin film on the surface of tumor cells;
b) macrophage phagocytosis;
c) allogeneic inhibition;
d) blocking antibodies;
e) T-suppressor;
f) T-killers;
g) NKcells.

40. Tumor necrosis factor (TNFα) causes in the body:
Variants of answer:
a) patient cachexia;
b) activates cytotoxicity of macrophages;
c) induces terminal differentiation of tumor cells;
d) attenuates tumor cell antigenicity;
e) activates natural killer.

41. What factors protect tumor cells from the immune mechanisms of the body?
Variants of answer:
a) blocking antibodies;
b) allogeneic inhibition;
c) fibrin film on the surface of tumor cells;
d) internalization of antigenic structures of tumor cell.

42. The basis of inefficiency of antitumor immunity are:
Variants of answer:
a) tumor cell antigenic simplification;
b) hyperproduction of corticosteroids;
c) hypoproduction of corticosteroids;

d) immunodeficiencies;
e) hyperproduction of antibodies.

43. Note the changes in the body associated with systemic effects of malignancies:

Variants of answer:

a) violation of nervous system;
b) violation of endocrine system;
c) stimulation of immunity;
d) immunodepression;
e) decrease in blood coagulation;
f) tendency to thrombosis.

44. Which of these conditions contribute to successful tumor transplantation from one animal to another?

Variants of answer:

a) high-protein diet of recipient;
b) starvation of recipient;
c) prior general X-ray irradiation of recipient;
d) selection of recipient of early childhood (puppy);
e) introduction of immunosuppressants into recipient;
f) introduction of IL2 into recipient.

45. Methods of cancer therapy are:

Variants of answer:

a) elimination of carcinogens from the environment;
b) prevention of contact of carcinogens with the body;
c) increase in activity of antitumor mechanisms of protection;
d) detection and treatment of benign tumors;
e) destruction (removal) of malignant tumor cells.

46. Specify the possible causes of cancer recurrence:

Variants of answer:

a) suppression of local immunity factors;
b) low activity of anticellular mechanisms of antitumor protection of organism;
c) maintain viable tumor cells after its removal or destruction;
d) penetration of a DNA fragment of tumor cells containing active oncogene in genome of normal cells;
e) penetration of "tumor" RNA fragment in normal cell.

STANDARD OF ANSWERS TO THE TEST TASKS

№ question	Correct answers	№ question	Correct answers	№ question	Correct answers	№ question	Correct answers
INTRODUCTION TO THE DISCIPLINE "PATHOLOGICAL PHYSIOLOGY". GENERAL DOCTRINE ABOUT DISEASE. GENERAL ETIOLOGY AND PATHOGENESIS							
1	b, d, e	7	a, b, d, f	13	b, d, e	19	c
2	b	8	a, c	14	a	20	d
3	c, d, e	9	b, c	15	a	21	b, e
4	c	10	c, d	16	b	22	a, e
5	a, c	11	a	17	c	23	b, d, e
6	a, f	12	a, b, f	18	b		
PATHOGENIC EFFECTS OF ENVIRONMENTAL FACTORS ON THE HUMAN BODY							
1	b, c, d	8	a, b, c, d, e	15	a	22	a, b
2	a	9	a, b, d, f	16	c, e	23	b, c, f, g
3	a, b, d, e, f	10	a, b, c, e	17	a, d, f	24	a, b, d
4	a, b, d, f	11	b, c, d, e	18	d	25	b
5	b, e, f	12	a, c, f	19	a, b, c		
6	b, c	13	c, e, f	20	a, b, d, e, g		
7	b	14	b	21	b, d		
THE ROLE OF HEREDITY IN PATHOLOGY							
1	b	8	b, c	15	b	22	c
2	c	9	b	16	a	23	a, b, d, e
3	a, b, f	10	a, c, d	17	d, f	24	a, b, f
4	a	11	a, e, f	18	b	25	a, c, d
5	b, c	12	c, e	19	b, c, f		
6	a, b, d	13	a, b, c, d, e	20	b		
7	a, b, c, d, e	14	d, f	21	b, c		
THE ROLE OF REACTIVITY, CONSTITUTION AND AGE IN THE DEVELOPMENT OF PATHOLOGY							
1	a, b, e	6	a, b, d, f	11	a, b, c, d	16	c, f, h
2	b, d	7	d	12	a, b, d, f	17	c, f, e
3	a, b, c, e, f	8	b	13	a, c, d	18	a, c, f, g
4	a, b, c	9	a, b, c, d, e	14	a, d, e, f	19	a, c, e
5	b, d	10	a, b, d	15	a, b, e		
CELL DAMAGE							
1	c, d, e	9	b, c, d, f	17	b, c, d, e	25	c, e
2	a, b, d, e, f	10	a, c	18	a, c, e, g	26	a, d, f
3	a, d, e	11	a, c, f, g	19	b, c, e, f, g	27	d, e
4	b, d	12	a, b, d	20	a, c, d, e, f	28	a, c, d, e
5	b, c, e	13	b, c, d	21	b, d, f	29	a, c, d, e, f
6	a, c, d	14	a, d, e, f	22	a, c		
7	a, b, c, e	15	b, c, d, e, f	23	a, c, e		
8	a, d, e, f	16	a, b, d, f, g	24	b, d, e		

№ question	Correct answers	№ question	Correct answers	№ question	Correct answers	№ question	Correct answers
TYPICAL FORMS OF MICROCIRCULATORY DISORDERS							
1	a, b, c, d	4	a, b, c, f	7	a	10	a, b
2	d	5	b, c, d, f	8	a	11	a, b, d
3	a, c, d, e	6	a, c, d, e	9	a, c	12	a, d
PERIPHERAL CIRCULATORY DISORDERS							
1	b, c, e	10	a	19	a, c, e, f	28	a, c, e
2	a, c, d	11	a	20	b, d, e	29	c, d
3	a, b, c, e	12	a, c, e, f	21	a, b, c, e, g	30	b
4	a, b, d, e	13	b, c, e	22	a, c, d, e	31	a, c, e
5	a, c, d	14	a, b	23	a, b, d, e	32	b, d, f
6	a, d	15	b, c, d, e	24	b	33	a, c, d
7	a, c, d, e	16	b, e	25	a, b, d		
8	b, d, e	17	a, c, d, e	26	a, b		
9	a, b, d	18	c, d, f	27	a, b		
INFLAMMATION							
1	a, b, d	11	a, b, c, d, e, g	21	b, c, e	31	a, b, c, e, f
2	a, c, d, e	12	d	22	a, d	32	e
3	b, d	13	d	23	b, c, d	33	e, f
4	a, c, e, f	14	b, c, d, f, g	24	a, b, d	34	a, b
5	b, c, d, e	15	a, d	25	a, b, c, d	35	a, d, f
6	a, b, c, d	16	a, b, c, d	26	a, b, c	36	b, e
7	a, b, d	17	a, b, c, d	27	a, c, d	37	a, b, c
8	a, f	18	a, b, c, d	28	a, b, d	38	b, c
9	b, c	19	a, c, d, f, g, h	29	a, b, d, e		
10	a, d, e	20	b, e, i	30	a, b, c, e		
INFECTIOUS PROCESS. FEVER							
1	b, c, d, f	9	a, b, c, d	17	b, c, e, f	25	b, d, f, g
2	a, c, e	10	a, b, c, e, f	18	a, d, e	26	b, d, f
3	a	11	d, e, f, g	19	b, c	27	b, d, e
4	a, c, d, f	12	b, c, e	20	a, b, d	28	a
5	a, b, c	13	a, c, d, f	21	a, e	29	a, b, c, d
6	a, c, d, f, g	14	a, c	22	a, c, e, g	30	a, b, d
7	b, c, d	15	b, c, d, e, f	23	a, b, c		
8	b, c, d, e	16	a, b, c, e	24	c, d, e		
IMMUNOPATHOLOGICAL PROCESSES							
1	c, d, f	14	a, b, e	27	b, c, d, e, f	40	a, d
2	b	15	a	28	a, c, d, f	41	a, c, d, f
3	a, e, f	16	a, c, e	29	a, b, d, e	42	a
4	a, c, e	17	a, d, e, f, g, h	30	a, b, e	43	a
5	a, c, d, f	18	b, c, e, g	31	c, d	44	a, b, c, e
6	b, c	19	b	32	a, b, d, e, f	45	a, b, c, e
7	a, b, g	20	a, c, e, f	33	c	46	a, c
8	a, b, d	21	c, e, f, g, h	34	a, b, e	47	d

№ question	Correct answers	№ question	Correct answers	№ question	Correct answers	№ question	Correct answers
9	a, c, d, f	22	a, b, d	35	b, c, d, e	48	a, c, d, f
10	d	23	b, c	36	b, c, e	49	a, c, d, e, g
11	b, d	24	c	37	a, b, e	50	a, b, c, d, e, g
12	a, c, d	25	c, d, e	38	c, e, g	51	c
13	c	26	a, b, c, d	39	a, b, d, f	52	a
TYPICAL METABOLIC DISORDERS. DISORDERS OF PROTEIN, VITAMINS, NUCLEIC ACIDS METABOLISMS. STARVATION							
1	a, b, e	8	a, c, e	15	a, b, d	22	a
2	c, d, f, g	9	a, c, e	16	c, e	23	c, d, e
3	b, c	10	b, c, e	17	a	24	e
4	a, d, e, f	11	a, b, d, e	18	a, b, c	25	a
5	a	12	b, d, e	19	a, b, e, f	26	a, d, e
6	b, d, e	13	b, d	20	d	27	c, d, e
7	a, b, c	14	a, d	21	c		
DISORDERS OF CARBOHYDRATE AND LIPID METABOLISMS							
1	c, d, f, h	10	a, d, f, g	19	a	28	a, c, d, e, f
2	c, e	11	b	20	a, b, c, d	29	a, b, d
3	a, d, f	12	b, c, e	21	c, d, f	30	b
4	b, c, e	13	a, c, d, f	22	b, e	31	a, b, c, d, f
5	a, b, c, d, g	14	a, b, c	23	a, c, d	32	a, c, d, f, g
6	b, c, d	15	a, b, c, d, e, f	24	a, b, c, f	33	a, b, c, d
7	a, c	16	c	25	a, c, d, g	34	a, b, d, e, f
8	b, d, e	17	a, c, d, e	26	a, b, c, e, f	35	a, b, e
9	b, d, f, g	18	b, d, f	27	a, b, e, f	36	a, c, d
DISORDERS OF ACIDBASE BALANCE, WATER-ELECTROLYTE AND MINERAL METABOLISM							
1	a, b, d	10	a, c, e	19	b, c, d	28	a, b, d, e, f
2	a, c, e, f	11	a, c, d, e, f	20	b, d, f	29	b, c, d
3	a, c	12	a, b, c, f, g	21	a, b, c	30	a, d, e
4	c, d	13	a, b, d, f	22	a, c, d, e	31	b, d, e
5	b, c, d, e	14	a, b, c, e	23	a, b, d, e	32	a, c, e
6	b, d, g	15	a, d, f	24	a, c, e	33	b, c, e
7	a, b, d, f	16	a, b, d, f	25	a, b, d, e	34	a, b, d
8	a, c, e	17	a, b, c, e	26	a, c	35	b, d, e
9	a, b, d, e	18	b, c, d, e	27	b, d	36	b, c, d
HYPOXIA							
1	b, c, d, f	6	c, f	11	a, c	16	a, b, d
2	c, d, e, f	7	d, f	12	a, b, d	17	a, b, c, d, f
3	b, e	8	a, e, f	13	b, d, e, f, g	18	a, d, e
4	b, c, d	9	a, d, f, g	14	a	19	a, b, c, d, g
5	c, d	10	a, b, c, f	15	e	20	a, b, c

№ question	Correct answers	№ question	Correct answers	№ question	Correct answers	№ question	Correct answers
EXTREME CONDITIONS							
1	b, c, f	10	a, b, c	19	b	28	b
2	a, c, d, e	11	a, c, d, f	20	b, c, e	29	a, d
3	a, b, c, d	12	b, c, e, f	21	a, c, d, e	30	a, c, e
4	a, c, e, g	13	a, c, e	22	a, b, c	31	b, c, d, f
5	b, e, f, g, h	14	a, c, d, e	23	a, b, c, e, f	32	a, d
6	c	15	a, b, e, f, g	24	a, b, c, d	33	a, b, c, f
7	a, b, c, d, f	16	a, c, d	25	a, c, d		
8	a	17	b, c, d	26	a, d		
9	a, b, d	18	c, d, e	27	a, b, e		
PATHOLOGY OF TISSUE GROWTH. TUMORS							
1	a, b, c, g	13	c	25	a, b, c	37	b, c, d
2	c	14	a	26	b	38	a, b, c, e, f
3	a, b, c, d	15	c	27	a, c, d	39	b, c, f, g
4	b, c, d	16	a, b, d	28	b, d, f	40	a, b, c, e
5	a, b, c	17	a, b, c, f, g	29	a, d, f, g	41	a, c, d
6	a, b, d	18	b, c, e, f	30	b, e	42	a, b, d
7	a, b, d, f	19	a, b, c, e	31	a, b, c, e, f	43	a, b, d, f
8	b, c, d,	20	c, d, e	32	a, c, d, f	44	b, c, d, e
9	a, e	21	a, c	33	a, d, e, f	45	c, e
10	a, b, c	22	d	34	a, c, e	46	c, d
11	b, c, d	23	d	35	a, c, e		
12	a, c, d	24	c, d	36	b, d		

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(на английском языке)

Учебно-методическое пособие
для студентов 3 курса факультета по подготовке специалистов
для зарубежных стран, обучающихся на английском языке
по специальности «Лечебное дело», медицинских вузов

В трех частях

Часть 1
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