MINISTRY OF HEALTH OF REPUBLIC OF BELARUS

EDUCATIONAL ESTABLISHMENT
«GOMEL STATE MEDICAL UNIVERSITY»

Normal physiology department

S. N. Melnik, E. M. Zaiko, N. I. Shtanenko et. al.

THE TEST TASKS ON NORMAL PHYSIOLOGY

The educational-methodical guidance

Gomel 2007

УДК 612 (076.5)=20
ББК 28.073я7
Ш 51

Авторы:
С. Н. Мельник, Э. М. Заика, Н. И. Штаненко, В. А. Мельник, Ю. И. Брель, Н. Б. Шевко, А. А. Жукова

Рецензент:
заведующий кафедрой нормальной физиологии УО «Витебский государственный медицинский университет им. Дружбы Народов», кандидат медицинских наук, доцент *Н. С. Новицкий.*

Мельник, С. Н.
Ш 51 The test tasks on normal physiology = Тестовые задания по нормальной физиологии: учеб.-метод. пособие / С. Н. Мельник [и др.]; под ред. проф. Э. С. Питкевича; пер. на англ. яз. Ю. И. Брель, В. А. Мельника. — Гомель: учреждение образования «Гомельский государственный медицинский университет», 2007. — 112 с.
ISBN 978-985-6779-91-9

Настоящее учебно-методическое пособие представляет собой тестовый материал по всем разделам нормальной физиологии для студентов факультета по подготовке специалистов для зарубежных стран по специальности лечебное дело, обучающихся на английском языке. Материалы пособия изложены в соответствии с действующими программами по нормальной физиологии для студентов высших медицинских учебных заведений, утвержденных Министерством здравоохранения Республики Беларусь. В конце пособия располагаются базовые константы физиологических систем в Международной системе физических единиц (СИ).

Утверждено и рекомендовано к изданию Центральным учебным научно-методическим Советом УО «Гомельский государственный медицинский университет» 12 ноября 2007, протокол № 7.

УДК 612 (076.5)
ББК 28.073я7

ISBN 978-985-6779-91-9

INTRODUCTION

The given educational-methodical guidance represents a test material on all sections of normal physiology for students of medical high schools. Material of the guidance is prepared according to the working program on normal physiology for students of the higher medical educational schools approved by Ministry of Health of Belarus.

The guidance contains the test questions including data on achievements of a modern physiological science and consists of introduction, the basic part which contains a material on physiology of blood, cardiovascular, respiratory and digestive systems, physiology of excretion, metabolism and energy, thermoregulation, excitable tissues, general and partial physiology of CNS, physiology of endocrine glands, analyzers and the higher nervous activity. At the end of the guidance base constants of physiological systems in the International system of physical units (SI) are given.

The given materials will allow to facilitate studding of normal physiology by medical students, will provide more effective studying and can be used for self-checking during preparation both for separate practical classes and for the state end-of-year examination.

Authors realize that in the given guidance because of its small volume it was not possible to illuminate in detail all aspects of above mentioned sections of normal physiology. More expanded information can be received from the list of the literature located at the end of the guidance.

Authors will be grateful to anyone for comments which will be considered in further editions.

ВВЕДЕНИЕ

Данное учебно-методическое пособие представляет собой тестовый материал по всем разделам нормальной физиологии для студентов медицинских вузов. Материалы пособия изложены в соответствии с действующими программами по нормальной физиологии для студентов высших медицинских учебных заведений, утвержденных Министерством здравоохранения Республики Беларусь.

Пособие содержит тестовые вопросы, включающие сведения о достижениях современной физиологической науки и состоит из введения, основной части, которая содержит материал по физиологии крови, сердечно-сосудистой, дыхательной и пищеварительной систем, физиологии выделения, обмена веществ и энергии, терморегуляции, возбудимых тканей, общей и частной физиологии ЦНС, физиологии желез внутренней секреции, анализаторов и высшей нервной деятельности. В конце пособия располагаются базовые константы физиологических систем в Международной системе физических единиц (СИ).

Представленные материалы позволят облегчить усвоение студентами-медиками учебного материала по нормальной физиологии, обеспечивает более эффективное его изучение и может быть использовано для самоконтроля при подготовке как к отдельному занятию, так и к государственному переводному экзамену.

При этом авторы осознают, что в данном пособии в связи с небольшим его объемом не представилось возможным осветить подробно все аспекты рассматриваемых разделов нормальной физиологии. Более расширенные сведения можно получить из списка литературы расположенного в конце пособия.

Авторы будут весьма благодарны всем, кто сочтет возможным высказать свои критические замечания в адрес предлагаемого пособия, которые будут восприняты как выражение желания оказать помощь в его улучшении при последующим переиздании.

UNITE 1
PHYSIOLOGY OF BLOOD

1. How the oncotic pressure of blood will be changed, if the amount of general protein in blood is not changed and the amount of albumins is decreased?

Variant of answers:

a) raises;

b) does not change;

c) it is reduced;

d) can both be reduced and raised.

2. How the amount of leukocytes changes after reception of food, muscular work, at pregnancy, strong emotions?

Variant of answers:

a) decreases;

b) will not change;

c) increases.

3. The person with group of blood A (Rh^+) can be a donor for people having group of blood...

Variant of answers:

a) A, Rh^-;

b) 0, Rh^+;

c) B, Rh^+;

d) A, Rh^+.

4. What is the difference of primary anticoagulants from secondary anticoagulants?

Variant of answers:

a) are activated by thrombin;

b) are formed in an organism constantly, do not depend on processes of blood coagulation;

c) are formed in an organism changeably, depend on processes of blood coagulation.

5. Buffer properties of proteins provide...

Variant of answers:

a) maintenance of osmotic pressure;

b) decrease of concentration of hydrogen ions in blood;

c) metabolism in blood;

d) maintenance of the constancy of concentration of hydrogen ions in blood.

6. What function of blood is caused by presence of antibodies and phagocytosis activity of leukocytes in blood?

Variant of answers:

a) protective;

b) trophic;

c) transport;

d) respiratory.

7. Respiratory function of blood is provided by...

Variant of answers:

a) heparin;

b) plasma;

c) hemoglobin;

d) thrombin.

8. What does the color parameter of blood reflect?

Variant of answers:

a) total amount of hemoglobin in blood;

b) the amount of hemolysed erythrocytes;

c) the amount of erythrocytes in 1 liter of blood;

d) relative saturation of erythrocytes with hemoglobin.

9. Destruction of the membrane of erythrocytes and the exit of hemoglobin into the plasma under action of various factors is named...

Variant of answers:

a) plasmolysis;

b) hemolysis;

c) fibrinolysis;

d) hemostasis;

e) homeostasis.

10. What pressure is created by the proteins of blood plasma?

Variant of answers:

a) osmotic;

b) hydrostatic;

c) oncotic;

d) hemodynamic.

11. What factors participate in maintenance of acid-alkaline balance of blood plasma?

Variant of answers:

a) osmotic pressure;

b) buffer systems;

c) ions and nutrients;

d) all answers are correct.

12. The increased amount of leukocytes in peripheral blood is named...

Variant of answers:

a) leukocytosis;

b) leucopoiesis;

c) leucopenia;

d) thrombocytosis.

13. Agglutinins are a component of...

Variant of answers:

a) erythrocytes;
b) plasma;
c) leukocytes;
d) thrombocytes.

14. What combination of agglutinogens and agglutinins corresponds to I group of blood?

Variant of answers:

a) AB and 0;
b) B and alpha;
c) 0 and alpha, beta;
d) A and beta.

15. Agglutinogens are a component of...

Variant of answers:

a) plasma;
b) nucleus of leukocytes;
c) thrombocytes;
d) membranes of erythrocytes.

16. To the person who have I group of blood, it is possible to transfuse...

Variant of answers:

a) any group of blood;
b) blood of IV group;
c) blood I of group;
d) blood of II group.

17. In person, who have III group of blood, plasma contains agglutinin...

Variant of answers:

a) beta;
b) alpha;
c) alpha, beta;
d) there are no agglutinins alpha and beta.

18. In person, who have IV group of blood, erythrocytes contain agglutinogens...

Variant of answers:

a) A;
b) B;
c) 0;
d) AB.

19. The Rhesus - antigen is a component of...

Variant of answers:

a) plasma;
b) membranes of erythrocytes;

c) nucleus of leukocytes;
d) membranes of thrombocytes.

20. For course of all phases of hemocoagulation participation of …ions is necessary:

Variant of answers:

a) sodium;
b) potassium;
c) calcium;
d) fluorine.

21. What factor provides transformation of soluble fibrin-polymer into insoluble fibrin?

Variant of answers:

a) II-prothrombin;
b) VII-proconvertin;
c) XIII-fibrinstabilization factor;
d) XI-antigemophilic globulin C.

22. What is plasmin and what is it necessary for?

Variant of answers:

a) the dry residual of plasma;
b) a protein of plasma;
c) protease, which activates formation of fibrin;
d) protease, which splits fibrin.

23. What factor is transformed from a soluble condition into insoluble condition during coagulation of blood?

Variant of answers:

a) fibrinogen;
b) antigemophilic globulin A;
c) prothrombin;
d) tissue thromboplastin.

24. The substances which prevent coagulation of blood and which have fibrinolytic action are named...

Variant of answers:

a) coagulants;
b) factors of blood coagulation;
c) anticoagulants;
d) homostatins.

25. Establish correct sequence of processes of vascular-platelet hemostasis:

Variant of answers:

a) a reflex spasm of the damaged vessels — aggregation of thrombocytes — adhesion of thrombocytes — compression of blood thrombus;

b) a reflex spasm of the damaged vessels — compression of blood thrombus — adhesion of thrombocytes — aggregation of thrombocytes;

c) a reflex spasm of the damaged vessels — adhesion of thrombocytes — aggregation of thrombocytes — compression of blood thrombus.

26. Establish correct sequence of processes of coagulating hemostasis:

Variant of answers:

a) formation of prothrombinase — transformation of fibrinogen into fibrin — formation of thrombin;

b) formation of prothrombinase — formation of thrombin — transformation of fibrinogen into fibrin;

c) transformation of fibrinogen into fibrin — formation of thrombin — formation of prothrombinase.

27. Establish correct sequence of processes of fibrinolysis:

Variant of answers:

a) transformation of plasminogen into plasmin — splitting of fibrin to peptides and amino acids — formation of the blood activator of plasminogen;

b) splitting of fibrin to peptides and amino acids — formation of the blood activator of plasminogen — transformation of plasminogen into plasmin;

c) formation of the blood activator of plasminogen — transformation of plasminogen into plasmin — splitting of fibrin to peptides and amino acids.

28. Blood of what group of system ABO does not contain agglutinogens A and B?

Variant of answers:

a) the first;

b) the second;

c) the third;

d) the fourth.

29. What cells produce histamin at their stimulation?

Variant of answers:

a) neutrophils;

b) eosinophils;

c) basophils;

d) monocytes.

30. What from the below mentioned functions is not carried out by leukocytes?

Variant of answers:

a) participate in phagocytosis;

b) participate in synthesis of collagen and elastin;

c) actively move;

d) migrate on a gradient of chemical factors;

e) participate in humoral and cellular immunity.

31. What cell is differentiated into a macrophage after an exit from a blood channel into surrounding tissues?

Variant of answers:

a) eosinophil;
b) basophil;
c) T-lymphocyte;
d) monocyte;
e) B-lymphocyte.

32. What blood cells contain active histaminase?

Variant of answers:

a) basophils;
b) monocytes;
c) eosinophils;
d) erythrocytes;
e) B-lymphocytes.

33. Carboxyhemoglobin is...

Variant of answers:

a) a bond of hemoglobin with CO_2;
b) a bond of hemoglobin with H_2CO_3;
c) a bond of hemoglobin with CO;
d) a bond of hemoglobin with Ca_2CO_3.

34. What protein of blood plasma provides transport of iron?

Variant of answers:

a) albumin;
b) transferrin;
c) transcobolamin II;
d) no one of named.

35. The most powerful buffer system is…

Variant of answers:

a) carbonate;
b) phosphate;
c) hemoglobin;
d) protein.

36. How the percentage ratio of separate kinds of leukocytes is named?

Variant of answers:

a) color parameter;
b) hematocrit;
c) leukocytic formula;
d) leukocytosis.

37. Neutrophils provide mainly...

Variant of answers:

a) production of specific antibodies;

b) transport of heparin;

c) phagocytosis of microorganisms;

d) activation of lymphocytes.

38. The function of eosinophils is...

Variant of answers:

a) transport of carbonic gas and oxygen;

b) maintenance of osmotic pressure;

c) production of antibodies;

d) desintoxication at allergic reactions.

39. Is it possible to transfuse repeatedly the blood of the same donor to the patient, and if is not, then why?

Variant of answers:

a) it is possible without restrictions;

b) it is possible, in small amounts;

c) it is possible, only the first group of system AB0;

d) it is impossible, because each person has the individual group of blood.

40. By what features of structure the lymph differs from plasma?

Variant of answers:

a) the greater concentration of proteins;

b) concentration of phospholipids;

c) the smaller concentration of proteins;

d) the greater concentration of uniform elements.

41. The system of hemostasis provides...

Variant of answers:

a) maintenance of liquid condition of blood;

b) coagulation of blood inside vessels;

c) maintenance of liquid condition of blood and coagulation of blood at damage of vessels;

d) compression of fibrin thrombus.

42. In 1939 G. F. Lang has formulated representation about blood as the system including...

Variant of answers:

a) peripheral blood, organs of haemopoiesis, organs of blood destruction;

b) peripheral blood, organs of haemopoiesis, organs of blood destruction, only humoral mechanism of regulation;

c) peripheral blood, organs of haemopoiesis, organs of blood destruction, neurohumoral apparatus of regulation.

43. What group of blood is determined, if at mixing a researched sample of blood with standard serums agglutination didn't take place with any of serums?

Variant of answers:

a) group of blood II (A);
b) group of blood I (0);
c) group of blood III (B);
d) group of blood IV (AB).

44. What group of blood is determined, if at mixing a researched sample of blood with standard serums agglutination took place with serums of I, II, III groups?

Variant of answers:

a) group of blood II (A);
b) group of blood I (0);
c) group of blood III (B);
d) group of blood IV (AB).

45. In what variant the impossible combination of agglutinogens and agglutinins in system AB0 is given?

Variant of answers:

a) B and alpha;
b) 0 and alpha, beta;
c) B and beta;
d) AB and 0.

46. Hematocrit characterizes...

Variant of answers:

a) system of hemostasis;
b) the volumetric ratio of uniform elements and plasma of blood;
c) the quantitative ratio of uniform elements of blood;
d) the ratio of uniform elements and serum of blood.

47. In what variant the Rhesus factor — conflict can be observed?

Variant of answers:

a) mother — Rh^+; father — Rh^-, a fetus — Rh^-;
b) mother — Rh^-; father — Rh^+, a fetus — Rh^-;
c) mother — Rh^+; father — Rh^-, a fetus — Rh^-;
d) mother — Rh^-; father — Rh^+, a fetus — Rh^+.

48. Set of the reactions which provide maintenance or restoration of a constancy of the internal environment of an organism is...

Variant of answers:

a) haemopoiesis;
b) homeostasis;
c) hemostasis;
d) hemolysis;
e) hematocrit.

49. How the decrease of amount of Ca^{2+} in blood plasma will influence on duration of coagulating hemostasis?

Variant of answers:

a) duration of hemostasis will increase;

b) duration of hemostasis will decrease;

c) duration of hemostasis will not change;

d) Ca^{2+} does not influence on duration of hemostasis.

50. How will erythrocyte sedimentation rate (ESR) change at increase of concentration of molecules of large proteins (globulins and fibrinogen) in blood plasma?

Variant of answers:

a) will decrease;

b) will not change;

c) will sharply decrease;

d) will increase.

UNITE 2
PHYSIOLOGY OF CARDIOVASCULAR SYSTEM

51. How process of periodic spontaneous excitation of heart is named?

Variant of answers:

a) automaticity;
b) conduction;
c) refracterity;
d) contraction.

52. What humoral factor makes only vasoconstrictor effect?

Variant of answers:

a) adrenaline;
b) noradrenaline;
c) both of them.

53. The big duration of potential of cardiomyocytes depends on the phase of a plateau caused by...

Variant of answers:

a) prolonged time of sodium activation;
b) opening of calcium channels of a cellular membrane and current of Ca^{++} into a cell;
c) delay of process of sodium activation;
d) delay of opening of calcium channels of a membrane.

54. What humoral factor stimulates work of heart?

Variant of answers:

a) acetylcholine;
b) adrenaline;
c) potassium ions;
d) endothelin.

55. How the tonus of depressor part of vasomotor center will change at increase of pressure in carotid sinus?

Variant of answers:

a) will not change;
b) it will be raised;
c) will be decreased.

56. Dicrotic rise on catacrotism of sphygmogram is caused by…

Variant of answers:

a) the reflected wave after closing of the aortal valve;
b) opening of a semilunar valve;
c) the phenomenon «aortal compressive chamber».

57. What effect is caused by putting of 1-st ligature by Stanius?

Variant of answers:

a) atrium and ventricle are contracting more slowly;
b) atrium and ventricle stop contractions;

c) atrium and ventricle are contracting without changes;
d) atrium and ventricle are contracting in different rhythm.

58. What is extrasystole?
Variant of answers:
a) the next contraction of heart;
b) heart contraction with increased force;
c) extra contraction of heart;
d) the next contractions of atriums.

59. What effects do vagus nerves produce on a cardiac muscle?
Variant of answers:
a) positive inotropic, negative chronotropic;
b) negative inotropic, positive chronotropic;
c) negative inotropic, negative chronotropic;
d) positive inotropic, positive chronotropic.

60. If to cut sympathetic and parasympathetic nerves which innervate the heart...
Variant of answers:
a) heart will stop contractions;
b) rhythm of heart contractions will decrease;
c) the rhythm of synoatricular node will appear;
d) the rhythm of atrioventricular node will appear.

61. The phenomenon of coming out of rhythm of heart from the influence of vagus nerve consists in...
Variant of answers:
a) renewal of contractions of the heart stopped under action of a sympathetic nerve;
b) renewal of contractions of the heart stopped under action of vagus nerve;
c) stop of heart contractions under action of vagus nerve;
d) decrease of rhythm of heart contraction under action of vagus nerve.

62. The phenomenon «the stairs of Boydich» is...
Variant of answers:
a) decrease of force of heart contractions at rhythmic simulation with growing frequency;
b) increase of frequency of heart contractions at rhythmic action of identical irritants;
c) increase of force of heart contractions at rhythmic simulation with growing frequency;
d) increase of excitability of heart at rhythmic action of identical irritants.

63. Electrocardiography is a method of the evaluation of...
Variant of answers:
a) work of heart;
b) force of contraction of heart;
c) excitation of heart.

64. Spontaneous impulses in synoatricular node arise at the person with frequency...

Variant of answers:

a) 20 impulses/minute;
b) 40–50 impulses/minute;
c) 30–40 impulses/minute;
d) 60–80 impulses/minute.

65. At what extrasystole there is compensatory pause?

Variant of answers:

a) ventricular;
b) atrial;
c) sinus;
d) any of the mentioned.

66. Synchronous contraction of cardiomyocytes is provided by...

Variant of answers:

a) an intracardial peripheral reflex;
b) features of intercellular interactions (nexuses);
c) endocellular regulation;
d) influence of vagus nerve.

67. Strengthening of contraction of left ventricle at the moderate stretching of walls of the right atrium is provided by...

Variant of answers:

a) intercellular interaction;
b) endocellular regulation;
c) an intracardial peripheral reflex;
d) influence of adrenaline.

68. Bathmotropic effect on activity of heart is a change of...

Variant of answers:

a) rhythm of heart contractions;
b) rate of conduction of excitation in myocardium;
c) excitability of myocardium;
d) force of heart contraction.

69. Inotropic effect on activity of heart is a change of...

Variant of answers:

a) excitability of myocardium;
b) rhythm of heart contractions;
c) rate of conduction of excitation in myocardium;
d) force of heart contraction.

70. Chronotropic effect on activity of heart is a change of...

Variant of answers:

a) force of heart contraction;
b) excitability of myocardium;

c) rhythm of heart contractions;
d) rate of conduction of excitation in myocardium.

71. What effect do sympathetic nerves produce on the cardiac muscle?
Variant of answers:
a) positive inotropic, negative chronotropic;
b) positive inotropic, positive chronotropic;
c) negative inotropic, positive chronotropic;
d) negative inotropic, negative chronotropic.

72. The terminations of the sympathetic nerve, which innervate the heart, release...
Variant of answers:
a) acetylcholine;
b) histamine;
c) noradrenalin;
d) serotonin.

73. The terminations of the vagus nerve, which innervate the heart, release...
Variant of answers:
a) adrenaline;
b) serotonin;
c) histamine;
d) acetylcholine.

74. What is the main reason of the appearance of the second tone of heart...
Variant of answers:
a) closing of clack-valves;
b) closing of semilunar valves;
c) contraction of ventricles;
d) contraction of atriums.

75. Dromotropic effect on activity of heart is a change of...
Variant of answers:
a) force of heart contraction;
b) excitability of myocardium;
c) rhythm of heart contractions;
d) rate of conduction of excitation in myocardium.

76. How the irritation of the sympathetic nerve influences on excitability and conductivity of heart?
Variant of answers:
a) reduces;
b) does not influence;
c) increases.

77. What changes of rhythm of heart contractions are observed at pressing on eyeballs (reflex of Danini-Achner) more often?

Variant of answers:

a) increases;

b) decreases;

c) rhythm does not change.

78. With the help of what reflex is it possible to decrease rhythm of heart contractions temporarily?

Variant of answers:

a) Danini-Achner's reflex;

b) Anrep's reflex;

c) Starling's reflex.

79. The greatest resistance in the big circle of blood circulation is observed at a level of...

Variant of answers:

a) large arteries;

b) average arteries;

c) capillaries;

d) arterioles.

80. What is the main reason of appearance of waves of the second order at record of work of heart?

Variant of answers:

a) influence of force and rhythm of heart contractions;

b) influence of respiratory movements of thorax;

c) influence of periodic changes of tonus of vasomotor center;

81. How arterial pressure will change after narrowing the lumens of renal arteries?

Variant of answers:

a) will not change;

b) it will increase (the renin-angiotensin-aldosteron system is included);

c) will decrease because of dilatation of vessels;

d) will decrease (the renin-angiotensin-aldosteron system is included).

82. At what level of vascular system the minimal linear rate of blood-flow is observed?

Variant of answers:

a) arteries;

b) veins;

c) capillaries;

d) arterioles;

e) aorta.

83. At what level of vascular channel the lowest blood pressure is marked?

Variant of answers:

a) venules;

b) capillaries;

c) arteries;

d) hollow veins;

e) arterioles.

84. In what answers the effects of angiotensin II are correctly named?

Variant of answers:

a) expressed vasodilatation, depression of the secretion of aldosteron by adrenal glands;

b) expressed vasoconstriction, simulation of the secretion of aldosteron by adrenal glands;

c) angiotensin II essentially does not influence on tonus of vessels;

d) angiotensin II is not a vasoactive substance.

85. How does linear rate of blood-flow change from aorta up to hollow veins?

Variant of answers:

a) remains constant at all levels of vascular system;

b) raises up to a level of capillaries, then it is reduced;

c) it is reduced up to a level of capillaries, then raises;

d) it is gradually reduced at all levels of vascular system.

86. How does pressure of blood change in various departments of a vascular channel from aorta up to hollow veins?

Variant of answers:

a) remains constant along all vascular system;

b) it is reduced along all vascular system;

c) it is reduced up to a level of capillaries, then raises;

d) raises up to a level of capillaries, then it is reduced.

87. Waves of the first order at direct registration of arterial pressure depend on…

Variant of answers:

a) respiratory movements of thorax;

b) force and rhythm of heart contractions;

c) periodic changes of tonus of vasomotor center;

d) all named factors.

88. What effect will be observed at irritation of presser department of vasomotor center?

Variant of answers:

a) dilatation of arteries, decreasing of arterial pressure, depression of work of heart;

b) there will be no changes of tonus of vessels, arterial pressure and work of heart;

c) narrowing of arteries, rise of arterial pressure, stimulation of work of heart.

89. In what example pulse pressure has the greatest size?

Variant of answers:

a) 120/80 mm of Hg;

b) 130/90 mm of Hg;

c) 110/60 mm of Hg;

d) 140/95 mm of Hg.

90. Basal tonus of a vascular wall is a degree of its active strain...

Variant of answers:

a) caused by neurogenic and humoral influences;

b) kept after elimination of neurogenic and hormonal influences;

c) caused by influence of adrenaline and noradrenaline;

d) caused by influence of thyroxin and vasopressin.

91. How linear rate of a blood-flow and speed of distribution of pulse wave correspond?

Variant of answers:

a) linear rate of a blood-flow is more;

b) are identical;

c) linear rate of a blood-flow is less.

92. At what pressure of blood do tones disappear at measurement of arterial pressure by Korotkov's method?

Variant of answers:

a) at diastolic pressure;

b) at systolic pressure;

c) at pulse pressure.

93. How does volumetric rate of a blood-flow in different parts of vascular system change?

Variant of answers:

a) it is more in arteries and less in veins;

b) it is the greatest in an aorta and large arteries;

c) does not change.

94. In what case will linear rate of a blood-flow be increased?

Variant of answers:

a) at increasing of total cross-section of all vessels;

b) at decreasing of volumetric rate of blood-flow;

c) at decreasing of total cross-section of all vessels.

95. In what department of the central nervous system is cardiovascular center situated?

Variant of answers:

a) in spinal cord;

b) in hypothalamus;

c) in medulla oblongata;
d) in thalamus.

96. According to scheme of Starling penetration of water from capillaries into tissues will be the more, if...

Variant of answers:

a) concentration of proteins (especially albumins) in plasma is decreased;
b) all answers are correct;
c) hydrostatic pressure in capillaries is increased;
d) hydrostatic pressure in interstitial fluid is decreased;
e) concentration of albumin in interstitial fluid is increased.

97. How is the method of registration of rhythmic fluctuations of walls of arteries named?

Variant of answers:

a) phlebography;
b) sphygmography.

98. What departments of cardio-vascular system contain up to 60–70% of all volume of blood?

Variant of answers:

a) arteries;
b) capillaries;
c) veins;
d) aorta.

99. The waves of the third order at direct registration of arterial pressure are caused by…

Variant of answers:

a) periodic change of force and rhythm of heart contractions;
b) respiratory movements of thorax;
c) periodic change of tonus of vasomotor center;
d) all named factors.

100. What wave of phlebogram is connected with the systole of atriums?

Variant of answers:

a) C-wave (the second wave);
b) V-wave (the third wave);
c) A-wave (the first wave).

UNITE 3

PHYSIOLOGY OF RESPIRATORY SYSTEM

101. Automaticity is a property of the structures of the respiratory center which are located in...

Variant of answers:

a) cortex of cerebrum;
b) spinal cord;
c) medulla oblongata;
d) pons varolii.

102. How will the respiration be changed after dissection of vagus nerves?

Variant of answers:

a) it will become frequent and superficial;
b) it will become frequent and deep;
c) it will become rare and superficial;
d) it will become rare and deep.

103. After dissection of spinal cord between cervical and thoracic departments...

Variant of answers:

a) there will be stop of respiration;
b) diaphragmal respiration will be kept;
c) costal respiration will be kept.

104. Transition of tissues from rest into an active state creates conditions for...

Variant of answers:

a) increasing of dissociation of oxyhemoglobin;
b) decreasing of dissociation of oxyhemoglobin.

105. How will affinity of hemoglobin to oxygen be changed at increasing of concentration of 2,3-diphosphat glycerate in erythrocytes?

Variant of answers:

a) it will be increased;
b) it will be decreased;
c) it will not be changed;
d) it can be changed differently.

106. How will affinity of hemoglobin to oxygen be changed at increasing of concentration of hydrogen ions and CO_2 in blood?

Variant of answers:

a) it will be increased;
b) it will be decreased;
c) it will not be changed;
d) it can be changed differently.

107. How will affinity of hemoglobin to oxygen be changed if the body temperature of the patient is increased up to 39°C?

Variant of answers:

a) it will be increased;

b) it will not be changed;

c) it will be decreased;

d) it will increased greatly.

108. Give the comparative characteristic of affinity of hemoglobin and myoglobin to oxygen.

Variant of answers:

a) affinity of hemoglobin is higher, than of myoglobin;

b) hemoglobin and myoglobin possess identical affinity to oxygen;

c) affinity of myoglobin is higher, than of hemoglobin;

d) myoglobin is not capable to connect with oxygen.

109. How will dissociation of oxyhemoglobin be changed at shift of the dissociation curve to the left?

Variant of answers:

a) will be increased;

b) will not be changed;

c) will be decreased;

d) can be changed differently.

110. How will affinity of hemoglobin to oxygen be changed at shift of the dissociation curve to the right?

Variant of answers:

a) will be decreased;

b) will be increased;

c) will not be changed;

d) can be changed differently.

111. Compare affinity of hemoglobin to oxygen in fetus (HbF) and in adult person (HbA):

Variant of answers:

a) affinity of HbA is higher, than of HbF;

b) both kinds of Hb possess identical affinity;

c) affinity of HbF is higher, than of HbA.

112. The maximum quantity of oxygen which can be connected by blood at full saturation of hemoglobin by oxygen is named...

Variant of answers:

a) oxygen capacity of blood;

b) color parameter;

c) the parameter of saturation;

d) hematocrit.

113. In what form is oxygen transported by blood?

Variant of answers:

a) only in dissolved state;

b) only in connection with hemoglobin;

c) in dissolved state and in connection with hemoglobin;

d) in connection with proteins of plasma of blood.

114. Can oxygen, physically dissolved in blood, provide needs of an organism for oxygen in usual conditions?

Variant of answers:

a) yes;

b) can, in conditions of rest;

c) no;

d) can, in conditions of the basal metabolism.

115. What valency does iron have in structure of a molecule of hemoglobin?

Variant of answers:

a) 3;

b) 4;

c) 2;

d) 1.

116. In what connections of hemoglobin iron is trivalent?

Variant of answers:

a) in oxyhemoglobin;

b) in carbohemoglobin;

c) in methhemoglobin;

d) in carboxyhemoglobin.

117. How many milliliters of oxygen one gram of hemoglobin can connect?

Variant of answers:

a) 0,8;

b) 2,5;

c) 1,34;

d) 1,8.

118. In normal conditions saturation of arterial blood by oxygen makes approximately...

Variant of answers:

а) 98–100%;

б) 92–98%;

в) 100–105%;

г) 60–75%.

119. How the oxygen capacity of blood will change at decreasing of concentration of hemoglobin?

Variant of answers:

a) will increase;

b) will not change;

c) will decrease;
d) can change differently.

120. In what form carbonic gas is transported by blood?
Variant of answers:
a) in form of bicarbonates;
b) in connection with proteins (carbocompounds) ;
c) in dissolved state;
d) all answers are correct.

121. Shift of the dissociation curve of oxyhemoglobin to the right promotes...
Variant of answers:
a) decreasing of supply of tissues by oxygen;
b) improvement of supply of tissues by oxygen;
c) development of oxygen starvation of tissues.

122. How will supply of a muscle by oxygen be changed, if at physical exercise the acid medium is created, concentration of CO_2 and temperature raises?
Variant of answers:
a) it will be increased;
b) it will be decreased;
c) it will not be changed.

123. Exchange of oxygen and carbonic gas between blood and tissues is carried out by ….
Variant of answers:
a) active transport;
b) participation of transmitting membrane proteins;
c) osmosis;
d) simple diffusion.

124. The coefficient of oxygen use in the person at physical exercise is increased up to …
Variant of answers:
a) 20–40%;
b) 90–100%;
c) 50–60%.

125. Where in blood is carbonic anhydrase mainly contained?
Variant of answers:
a) in plasma;
b) in leukocytes;
c) in erythrocytes;
d) in thrombocytes.

126. Insufficient supply of tissues by oxygen is named...
Variant of answers:
a) hypercapnia;

b) asphyxia;
c) acidosis;
d) hypoxia.

127. Activity of the respiratory center depends on...

Variant of answers:

a) pCO_2, pO_2, pH of arterial blood;
b) amount of uniform elements of blood;
c) hematocrit.

128. What receptors of lungs participate in regulation of respiration?

Variant of answers:

a) central and peripheral chemoreceptors;
b) stretch receptors of a stretching, irritant receptors, J-receptors (juxtacapillar);
c) all answers are correct.

129. The main effect of hyperbarotherapy consists in improvement of delivery of oxygen to tissues due to increasing of...

Variant of answers:

a) connection of oxygen with hemoglobin;
b) alveolar ventilation;
c) solubility of oxygen in plasma of blood.

130. Caisson disease is developed at fast transition from a zone of ...

Variant of answers:

a) high barometric pressure into a zone of lower barometric pressure;
b) low barometric pressure into a zone of higher barometric pressure;
c) atmospheric pressure of 760 mm Hg. into a zone with the same pressure.

131. Hypercapnia and decreasing of pH of blood (acidosis) are accompanied by development of...

a) eupnea;
b) hyperpnea;
c) apnea;
d) periodic respiration.

132. Hypocapnia and increasing of pH of blood (alkalosis) are accompanied by development of...

Variant of answers:

a) hyperpnea;
b) eupnea;
c) hypopnea;
d) asphyxia.

133. Peripheral chemoreceptors, which participate in regulation of respiration, are located mainly...

Variant of answers:

a) in pleura;
b) in carotid sinus and arch of aorta;
c) in respiratory muscles;

d) in trachea.

134. What receptors of lungs react to action of tobacco smoke, dust, mucus, gases of caustic substances?

Variant of answers:

a) stretch receptors;
b) J-receptors;
c) irritant receptors;
d) all named receptors.

135. What factor promotes decreasing of surface tension of alveoles?

Variant of answers:

a) surfactant;
b) Fletcher's factor;
c) bradykinin;
d) lysozyme.

136. In what act of respiration do internal intercostal muscles participate?

Variant of answers:

a) quiet inspiration;
b) forced inspiration;
c) forced expiration;
d) quiet expiration.

137. If partial pressure of gas above a liquid is higher than its voltage in a liquid...

Variant of answers:

a) gas will go from a liquid;
b) gas ill not be dissolved in a liquid;
c) gas it will be dissolved in a liquid.

138. Permeability of a membrane of alveoles for gases is characterized by the parameter...

Variant of answers:

a) diffusion ability of lungs;
b) elastic resistance of lungs;
c) size of dead space;
d) size of vital capacity of lungs.

139. The physiological dead space is the sum of...

Variant of answers:

a) anatomic dead space and respiratory volume;
b) anatomic and alveolar dead spaces;
c) anatomic dead space and residual volume;
d) alveolar dead space and reserve volume of inspiration.

140. The voltage of gas in a liquid is a force, with which...

Variant of answers:

a) gas molecules aspire to be dissolved in a liquid;

b) gas molecules cooperate among themselves;
c) gas molecules aspire to go from a liquid;
d) all answers are correct.

141. What factor provides about 2/3 of elastic resistance of lungs?

Variant of answers:

a) lysozyme;
b) heparin;
c) histamine;
d) surfactant.

142. What is the name of the condition at which air penetrate into a pleural cavity?

Variant of answers:

a) hemothorax;
b) pneumothorax;
c) hydrothorax;
d) Plevritis.

143. Negative pressure in pleural cavity is provided mainly by...

Variant of answers:

a) decrease of tonus of bronchioles;
b) presence f dead space;
c) elastic traction of lungs;
d) aerohematic barrier.

144. Maximal volume of air which can be present in lungs is named…

Variant of answers:

a) vital capacity of lungs;
b) functional residual capacity;
c) general capacity of lungs;
d) reserve volume of lungs.

145. In fetus the dissociation curve of oxyhemoglobin is shifted to…

Variant of answers:

a) to the left;
b) to the right;
c) dissociation curves of oxyhemoglobin of fetus and mother are identical.

146. Name correct sequence of stages of respiration.

Variant of answers:

a) ventilation f lungs, gas exchange in lungs, transport of gases by blood, biological oxidation, gas exchange between blood and tissues;

b) gas exchange in lungs, ventilation of lungs, transport of gases by blood, gas exchange between blood and tissues s, biological oxidation;

c) ventilation of lungs, gas exchange in lungs, transport of gases by blood, gas exchange between blood and tissues, biological oxidation.

147. In result of lungs ventilation …

Variant of answers:

a) exchange of air in the gas-exchange zone occurs;
b) purification warming and humidifying of air occurs;
c) all answers are correct;
d) maintenance of constancy of structure of alveolar air occurs.

148. Lungs of the adult person are in the stretched condition...

Variant of answers:

a) constantly;
b) during quiet inspiration;
c) during expiration;
d) during forced inspiration.

149. Elastic traction of lungs is…

Variant of answers:

a) the force directed on increase of volume of lungs;
b) the passive strain of elastic fibres of lungs tissue;
c) the tonus of bronchial muscles;
d) the force directed on decrease of volume of lungs.

150. How the lumen of respiratory ways changes during inspiration?

Variant of answers:

a) decreases;
b) increases;
c) in the beginning increases, and then decreases;
d) do not change.

UNITE 4

PHYSIOLOGY OF DIGESTION

151. The stage of saturation, which appears before coming of products of food hydrolysis into the blood, is named…

Variant of answers:

a) sensor saturation;
b) metabolic saturation;
c) true saturation;
d) humoralsaturation.

152. The stage of saturation, which is caused by coming of products of food hydrolysis into the blood, is named…

Variant of answers:

a) imaginary saturation;
b) true saturation;
c) sensor saturation.

153. The basic type of digestion at the person is …

Variant of answers:

a) symbiotic;
b) aytolytic;
c) hemotrophic;
d) own digestion.

154. In what department of CNS is the center of salivation situated?

Variant of answers:

a) in intermediate brain;
b) in medulla oblongata;
c) in midbrain;
d) in spinal cord.

155. Can absorption be carried out in oral cavity?

Variant of answers:

a) only some substances can be absorbed;
b) absorption begins only in stomach;
c) reabsorption begins only in small intestines;
d) absorption begins only in large intestines;
e) all substances can be absorbed.

156. Enzymes of saliva basically split …

Variant of answers:

a) fibers;

b) fats;
c) carbohydrates.

157. Excretion of big volume of not-concentrated saliva is observed at irritation of …

Variant of answers:
a) accessorius nerve;
b) sympathetic nerve;
c) parasympathetic nerve;
d) facial nerve.

158. Excretion of small volume of concentrated saliva is observed at irritation of…

Variant of answers:
a) accessorius nerve;
b) sympathetic nerve;
c) parasympathetic nerve;
d) trigeminal nerve.

159. What phase of gastric secretion can be studied during the experience of «imaginary feeding»?

Variant of answers:
a) gastric and cerebral phases;
b) cerebral phase;
c) intestinal phase;
d) cerebral, gastric, intestinal phases.

160. At removal of a significant part of a stomach the anemia develops because of the lack of …

Variant of answers:
a) Hageman factor;
b) fibrinstabilisating factor;
c) Kastl‘s internal factor;
d) pepsinogen.

161. How the motor activity of a stomach is changed under the influence of gastrin?

Variant of answers:
a) it is decreased;
b) it is not changed;
c) it is increased.

162. Denaturation and swelling of proteins in a stomach is caused by …

Variant of answers:
a) pepsin;
b) pepsinogen;
c) lipase;

d) carbonic acid;
e) hydrochloric acid.

163. What substances are evacuated from a stomach with the smallest speed?

Variant of answers:

a) carbohydrates;
b) fats;
c) proteins.

164. The gastric juice has the greatest acidity at digestion of …

Variant of answers:

a) fats;
b) proteins;
c) carbohydrates.

165. What is the influence of adrenaline and acetylcholine on the motor activity of an isolated department of small intestines?

Variant of answers:

a) adrenaline increases, acetylcholine decreases;
b) adrenaline does not influence, acetylcholine decreases;
c) adrenaline decreases, acetylcholine does not influence;
d) adrenaline decreases, acetylcholine increases.

166. Trypsinogen is activated under the influence of …

Variant of answers:

a) secretin;
b) hydrochloric acid;
c) enterokinase;
d) gastrin.

167. What enzymes of pancreas does trypsin activate?

Variant of answers:

a) only trypsinogen;
b) allenzymes, except for trypsinogen;
c) amyase, motrypsinogen;
d) trypsinogen, prophospholipase A, proelastase, procarboxypeptidases A and B;
e) lipolitic enzymes.

168. What regulation mechanisms play the leading role at digestion in the large intestines?

Variant of answers:

a) local;
b) gumoral;
c) nervous;
d) nervous, moral, local.

169. What enzymes of pancreas are secreted in an active condition?

Variant of answers:

a) trypsinogen, chymotrypsinogen;
b) procarboxypeptidases;
c) proteases;
d) amylase, nucleases.

170. What enzymes of pancreas are secreted in the form of zymogens (inactive predecessors)?

Variant of answers:
a) amylase, lipase;
b) trypsinogen, chymotrypsinogen;
c) nucleases.

171. What process constantly takes place in a liver…

Variant of answers:
a) production of bile;
b) excretion of bile;
c) production and excretion of bile.

172. How the structure of hepatic bile and gall bladder bile differs?

Variant of answers:
a) hepatic bile is more concentrated;
b) essentially do not differ;
c) gall bladder bile is more concentrated.

173. Fats in the duodenum are emulsificated by…

Variant of answers:
a) bile;
b) lipase;
c) mucous;
d) hydrochloric acid.

174. What is the normal active reaction pH of intestinal secret?

Variant of answers:
a) neutral;
b) alkaline;
c) acid.

175. Hydrolysis of vegetative tissue in the large intestines goes under influence of enzymes of…

Variant of answers:
a) vegetative tissue is not hydrolyzed in an organism;
b) microflorae;
c) pancreatic juice;
d) enterocytes.

176. What type of contractions is not characteristic for the large intestines in norm?

Variant of answers:

a) peristaltic contractions;
b) pendulum contractions;
c) rhythmic segmentation;
d) antiperistaltic contractions.

177. The basic department of gastrointestinal tract, in which absorption of products of food hydrolysis and water occurs, is…

Variant of answers:

a) stomach;
b) small intestines;
c) rectum;
d) large intestines.

178. Pepsinogen in a stomach it is synthesized by…

Variant of answers:

a) parietal cells;
b) mucocytes;
c) chief cells;
d) G-cells.

179. What department of gastrointestinal tract carries out the function of deposition of food?

Variant of answers:

a) small intestines;
b) stomach;
c) large intestines;
d) rectum.

180. What properties of food substances are preserved after their hydrolysis in gastrointestinal tract?

Variant of answers:

a) specific individuality;
b) antigenic properties;
c) energetic and plastic value;
d) constant molecular structure.

181. At what kind of digestion hydrolysis of substances is carried out due to enzymes of microorganisms?

Variant of answers:

a) aytolytic;
b) at all types;
c) symbiotic.

182. What principle is the base of functioning of digestive system?

Variant of answers:

a) independent functioning of separate organs;
b) synthetic;

c) conveyor;
d) all answers are correct.

183. What food substances are basically digested by enzymes in a stomach?

Variant of answers:

a) only fats;
b) only proteins;
c) proteins, emulsificated fats and insignificant amount of carbohydrates.

184. What component of the gastric juice protects the mucous membrane of a stomach from self-digestion?

Variant of answers:

a) pepsin;
b) lipase;
c) gastricsin;
d) mucin;
e) hydrochloric acid.

185. What conditions are necessary for transformation of pepsinogens into pepsins?

Variant of answers:

a) presence mucins;
b) absence of gastric lypase;
c) presence of hydrochloric acid.

186. What phase of gastric secretion takes place at seeing and smelling of food?

Variant of answers:

a) gastric;
b) cerebral;
c) gastric and intestinal;
d) intestinal.

187. What is the effect of irritation of vagus nerve on gastric secretion?

Variant of answers:

a) sharp decreasing of secretion;
b) the termination of secretion;
c) increasing of secretion;
d) the vagus nerve does not influence on gastric secretion.

188. What function does not concern to functions of digestive system?

Variant of answers:

a) secretory;
b) hemopoietic;
c) excretory;
d) respiratory;
e) endocrine.

189. Decreasing of excretion of bile into duodenum will affect on digestion of…

Variant of answers:

a) proteins;
b) carbohydrates;
c) proteins and carbohydrates;
d) fats.

190. In what department of gastrointestinal tract there is membrane digestion?
Variant of answers:
a) in a stomach;
b) in large intestines;
c) in oral cavity;
d) in small intestines;
e) in all named departments.

191. What is the basic role of membrane (parietal) digestion?
Variant of answers:
a) realization of initial stages of hydrolysis of nutrients;
b) hydrolysis of fats and carbohydrates;
c) absorption of vitamins;
d) final hydrolysis and absorption of nutrients.

192. What the positive role of microflora of intestines?
Variant of answers:
a) formation of immunological barrier of an organism;
b) synthesis of vitamins of group B and K;
c) partial digestion of vegetative tissue;
d) all answers are correct;
e) inactivation of enzymes.

193. What phase does not concern to phases of gastric secretion?
Variant of answers:
a) pancreatic;
b) intestinal;
c) gastric;
d) complex-flex.

194. What are not-digestive functions of digestive system?
Variant of answers:
a) hydrolysis of food substances;
b) participation in hemopoiesis, excretory function;
c) absorption of products of hydrolysis;
d) motor function.

195. In what condition is fat present in mother's milk and what it matters for its digestion?
Variant of answers:
a) in emulsificated condition, that accelerates the action of lipase;

b) in hydrolyzed condition, that raises its consumption;
c) in emulsificated condition, that accelerates the action of amylase.

196. What processes mainly occur in large intestines?

Variant of answers:

a) intensive absorption of water, formation of fetus masses, synthesis of vitamins;
b) intensive hydrolysis of food substances;
c) intensive membrane digestion;
d) secretion of hydrochloric acid;
e) hydrolysis of proteins, fats and carbohydrates.

197. What enzymes of a pancreas do not participate in hydrolysis of proteins?

Variant of answers:

a) carboxypeptidase A;
b) trypsin;
c) chymotrypsin;
d) amylase, lipase;
e) carboxypeptidase B.

198. What do parietal cells of the mucous membrane of a stomach produce?

Variant of answers:

a) pepsinogens;
b) mucin;
c) lysozyme;
d) hydrochloric acid;
e) lipase.

199. What is the influence of irritation of sympathetic nerves on pancreatic secretion?

Variant of answers:

a) increase of secretion;
b) decrease of secretion;
c) sympathetic nerves do not influence on pancreatic secretion.

200. What happens with proteolytic enzymes of gastric juice in the alkaline environment?

Variant of answers:

a) they are activated;
b) they are destructed;
c) they do not change their properties.

UNITE 5

METABOLISM AND ENERGY. THERMOREGULATION

201. The positive nitrogen balance is observed…

Variant of answers:

a) in old persons;

b) in trained sportsmen;

c) at starvation.

202. Surgical operation has led to decrease of ability of an animal to support normal body temperature at low temperature of the environment , because…

Variant of answers:

a) hypophysis is damaged;

b) nucleus of anterior group of hypothalamus are damaged;

c) epiphysis is damaged;

d) nucleus of posterior group of hypothalamus are damaged.

203. Why at the same temperature of air the person is felling more cold in «wet» weather, than in dry weather?

Variant of answers:

a) evaporation of liquids decreases;

b) heat conduction of air increases;

c) evaporation of liquids increases.

204. At what conditions increasing of sweat production will not lead to increasing of heat irradiation?

Variant of answers:

a) at formation of very concentrated sweat;

b) at very low humidity of air;

c) at very high humidity of air.

205. Why the person in synthetic (nylon) shirt bare the hot weather much more hardly, than in cotton shirt?

Variant of answers:

a) heat production is decreased;

b) heat irradiation is decreased;

c) evaporations of sweat is decreased.

206. Where is the center of thermoregulation situated?

a) in medulla;

b) in midbrain;

c) in hypothalamus;
d) in cerebellum;
e) in pons varolii.

207. The negative nitrogen balance is observed…

Variant of answers:

a) during growth;
b) at long physical exercise;
c) during pregnancy;
d) in old persons.

208. What transformations of substances give the energy for the organism?

Variant of answers:

a) synthesis of substances in cells;
b) oxidation of substances in tissues up to end-products;
c) processes of absorption.

209. What way of heat irradiation will be the main for the person if the surrounding temperature is 40°C and humidity is normal?

Variant of answers:

a) heat conduction;
b) heat irradiation;
c) convection;
d) evaporation;
e) all answers are correct.

210. How does the tonus of skin vessels change under influence of a cold?

Variant of answers:

a) decreases;
b) increases;
c) does not change.

211. The thermal balance is…

Variant of answers:

a) all answers are correct;
b) balance between heat production and heat exchange;
c) balance between contractive and not contractive heat production.

212. Brown fat in an organism provides…

Variant of answers:

a) formation of energy;
b) synthesis of ATP;
c) increase of heat production;
d) mobilization of glycogen.

213. The caloric equivalent of oxygen is…

Variant of answers:

a) the relation of exhaled CO_2 to inhaled O_2;
b) the amount of heat released at consumption of 1 liter of oxygen;
c) the relation of the inhaled O_2 to the exhaled CO_2.

214. The size of the daily basal metabolism at men makes…

Variant of answers:
a) 3000 kcal;
b) 1000 kcal;
c) 2500 kcal;
d) 1700 kcal.

215. At women the basal metabolism in comparison with men…

a) is identical;
b) is less on 10–15%;
c) is more on 10–15%;
d) is less on 30–40%.

216. What kind of heat release will the organism have in conditions of sauna?

Variant of answers:
a) convection;
b) heat conduction;
c) heat irradiation;
d) evaporation;
e) all answers are correct.

217. What ratio of proteins, fats and carbohydrates in a diet is optimal?

Variant of answers:
a) 1 : 4 : 1;
b) 4 : 1 : 1;
c) 1 : 1 : 4;
d) 1 : 2 : 4.

218. The positive nitrogen balance is observed …

Variant of answers:
a) in adults;
b) in old persons;
c) at starvation;
d) in children and pregnant women;
e) all answers are correct.

219. Cold shivering is an example of …

Variant of answers:
a) physical;
b) heat conduction;
c) chemical thermoregulation;
d) all answers are correct.

220. Subcutaneous fatty tissue with small heat conduction of fat …

Variant of answers:

a) increases heat release;

b) decreases heat release;

c) has no influence on heat release;

d) decreases heat production.

221. In clinical practice hypothermia it is applied…

Variant of answers:

a) for increasing of metabolism of brain and increasing of requirement of brain in oxygen;

b) for increasing of oxidizing processes of an organism;

c) for decreasing of metabolism of brain and decreasing of requirement of brain in oxygen;

d) for increasing of consumption of oxygen by an organism.

222. The minimum amount of proteins which is constantly breaking up in an organism in the condition of rest, counted on 1 kg of body weights is named…

Variant of answers:

a) efficiency coefficient;

b) respiratory factor;

c) breaking coefficient.

223. How does the condition of skeletal muscles change under action of cold?

Variant of answers:

a) there is relaxation of skeletal muscles;

b) does not change;

c) all answers are correct;

d) there is muscular shiver.

224. How heat production changes under action of cold?

Variant of answers:

a) decreases;

b) increases;

c) does not change.

225. What area of a body of the person has the highest temperature?

Variant of answers:

a) liver;

b) rectum;

c) axillary hollow;

d) under the tongue.

226. What hormone most strongly increases the heat production?

Variant of answers:

a) insulin;

b) aldosteron;

c) oxythoci;
d) thyroxin;
e) antidiuretic hormone.

227. Decrease of the body temperature at cooling happens because…

Variant of answers:

a) contractive heat production is more than not contractive heat production;
b) heat release is more than heat production;
c) increasing of chemical thermoregulation happens.

228. What is the principle of the direct calorimetry?

Variant of answers:

a) calculation of the amount of consumed oxygen;
b) direct measurement of heat irradiated by an organism;
c) definition of respiratory factor;
d) principle of isodinamia.

229. What organ mainly provide heat production at rest?

Variant of answers:

a) Skin and subcutaneous fat tissue;
b) skeletal muscles;
c) organs of thoracic cavity;
d) liver.

230. What food has the most expressed specifically dynamic action?

Variant of answers:

a) protein;
b) mixed;
c) fat;
d) carbohydrate.

231. How the nitrogen balance at the person will change at significant decrease of proteins in food?

Variant of answers:

a) becomes positive;
b) becomes equilibrium;
c) becomes negative.

232. General energy use is the sum of …

Variant of answers:

a) the specifically dynamic action of food and the working increase;
b) the basal metabolism and the specifically dynamic action of food;
c) the basal metabolism and the working increase;
d) the basal metabolism.

233. The daily need of the middle-aged person for carbohydrates is equal to …

Variant of answers:

a) 150–200 g;

b) 400–450 g;
c) 80–100 g;
d) up to 800 g.

234. What will be observed at absence of unchangeable aminoacids in consumed food?

Variant of answers:
a) positive nitrogen balance;
b) negative nitrogen balance;
c) nitrogen equilibrium.

235. Splitting of complex organic substances up to simple with releasing of energy is named …

Variant of answers:
a) assimilation;
b) energy balance;
c) dissimilation;
d) the basal metabolism.

236. The condition, at which the amount of nitrogen excreted from an organism is less, than consumpted nitrogen, is named …

Variant of answers:
a) positive nitrogen balance;
b) negative nitrogen balance;
c) nitrogenous equilibrium;
d) nitrogen optimum.

237. The effect of strengthening of metabolism and energy use after reception of the food is named…

Variant of answers:
a) isodinamia of nutrients;
b) specifical dynamic action of food;
c) comprehensibility of food;
d) the basal metabolism.

238. The temperature of comfort for easily dressed person is the air temperature (in degrees on Celsiy) …

Variant of answers:
a) 16–18;
b) 22–24;
c) 26–28;
d) 18–20.

239. Under influence of adrenaline the body temperature …

Variant of answers:
a) goes down;
b) does not change;
c) increases.

240. Release of heat by the person, who is in cold water, is carried out mainly by …

Variant of answers:
a) evaporation;
b) heat irradiations;
c) heat conduction;
d) all answers are correct.

241. In usual conditions release of heat by an organism is carried out by …
Variant of answers:
a) increase of tonus of muscles and shivering;
b) heat irradiation, convection, heat conduction, evaporation;
c) only heat irradiation, convection, heat conduction;
d) heat irradiation, convection, evaporation and heat production.

242. The basal metabolism of an organism is …
Variant of answers:
a) the amount of energy necessary for life in usual conditions;
b) the minimum amount of energy necessary for maintenance of ability to live;
c) the maximum amount of energy necessary for life.

243. How the basal metabolism is changed after 35–40 years old?
Variant of answers:
a) is increased;
b) is decreased;
c) is not changed.

244. Synthesis of complex organic substances from simple substances with the use of energy is named…
Variant of answers:
a) assimilation;
b) working exchange;
c) dissimilation;
d) the basal metabolism.

245. What is the characteristic of homoeothermic animals?
Variant of answers:
a) their body temperature depends on the temperature of the environment;
b) they have the constant level of metabolism;
c) their body temperature is constant and does not depend on the temperature of the environment.

246. How many energy is released at splitting of 1 g of proteins in an organism?
Variant of answers:
a) 4,1 kcal;
b) 9,3 kcal;
c) 5,1 kcal.

247. The highest body temperature of the healthy person is observed at …

Variant of answers:
a) 7 o'clock;
b) 18 o'clock;
c) 4 o'clock;
d) 10 o'clock.

248. The lowest body temperature of the healthy person is observed in …
Variant of answers:
a) 7 o'clock;
b) 13 o'clock;
c) 4 o'clock;
d) 19 o'clock;
e) 16 o'clock.

249. The daily need of the middle-aged person for proteins is equal to …
Variant of answers:
a) 150–200 g;
b) 400–450 g;
c) 70–80 g;
d) up to 800 g.

250. The daily balance of water of the adult person makes ….
Variant of answers:
a) 150–200 ml;
b) 4000–4500 ml;
c) about 2500 ml.

UNITE 6
PHYSIOLOGY OF EXCRETION

251. Aldosteron causes …

Variant of answers:

a) decrease of reabsorption of sodium, secretion of potassium and hydrogen;
b) increase of reabsorption of sodium, secretion of potassium and hydrogen.

252. What hormone increases reabsorption of sodium?

Variant of answers:

a) antidiuretic hormone;
b) natriuretic hormone;
c) parathyroid hormone;
d) aldosterone;
e) adrenaline.

253. What hormone causes increase of excretion of sodium from an organism?

Variant of answers:

a) aldosterone;
b) antidiuretic hormone;
c) adrenaline;
d) natriuretic hormone;
e) parathyroid.

254. Kidneys participate in regulation of coagulation of blood due to production of the activator of plasminogen which is named …

Variant of answers:

a) phosphatase;
b) rennin;
c) urokinase;
d) angiotensin;
e) erythropoietin.

255. Kidneys participate in regulation of haemopoiesis due to production of…

Variant of answers:

a) rennin;
b) urokinase;
c) angiotensin;
d) erythropoietin;
e) phosphatase.

256. Kidneys participate in regulation of arterial pressure due to production of…

Variant of answers:

a) renin;
b) urokinase;
c) angiotensin;
d) erythropoietin;
e) phosphatase.

257. Hydrostatic pressure of blood in glomerular capillaries is equal to…

Variant of answers:

a) 11 mm Hg;
b) 70 mm Hg;
c) 120 mm Hg.

258. The glomerular ultrafiltrate has structure which is close to structure of…

Variant of answers:

a) final urine;
b) arterial blood;
c) venous blood;
d) plasmas of blood.

259. What is passively reabsorbed in the proximal department of nephron …

Variant of answers:

a) glucose;
b) sodium;
c) aminoacids;
d) water.

260. What urine is formed in conditions of decreased amount of water in an organism?

Variant of answers:

a) hypotonic urine;
b) normotonic urine;
c) hypertonic urine;
d) isoosmolar urine.

261. What urine is formed in conditions of increased amount of water in an organism?

Variant of answers:

a) hypotonic urine;
b) normotonic urine;
c) hypertonic urine;
d) isoosmolar urine.

262. How effective filtration pressure in a kidney will change at increase of oncotic pressure of blood?

Variant of answers:

a) will decrease;

b) will increase;
c) will not change.

263. Mainly what proteins of blood plasma can appear in urine at the pathology of kidneys?

Variant of answers:
a) globulins;
b) fibrinogen;
c) gamma-globulins;
d) albumins.

264. Process of reabsorption at urine formation is:

Variant of answers:
a) the active absorption of some substances from blood into renal tubules;
b) the process of the reverse absorption of substances from renal tubules into blood;
c) the passive absorption of some substances from blood into renal tubules.

265. Reabsorption of water in kidneys it is carried out by …

Variant of answers:
a) active transport;
b) secretion;
c) all answers are correct;
d) passive transport.

266. Process of secretion at urine formation is …

Variant of answers:
a) the passive excretion of exchange products from an organism;
b) the active excretion of substances from blood into renal tubules;
c) the filtration of blood plasma into renal tubules;
d) the active filtration of glucose into renal tubules.

267. Renin is formed in …

Variant of answers:
a) adrenal glands;
b) juxtaglomerular apparatus of kidneys;
c) superficial nephron;
d) anterior lobe of hypophysis.

268. Normal daily amount of final urine is equal to …

Variant of answers:
a) 15–20 l;
b) 150–180 l;
c) 1,5–2 l;
d) 3–5 l.

269. How speed of glomerular filtration will change at narrowing of efferent arteriole?

Variant of answers:
a) will increase;

b) will decrease;
c) will not change.

270. In what department of nephron is glucose basically reabsorbed?

Variant of answers:

a) loop of Henle;
b) distal tubules;
c) collective tubules;
d) proximal tubules.

271. Where is antidiuretic hormone produced?

Variant of answers:

a) in thalamus;
b) in hypophysis;
c) in frontal lobe of cortex of cerebrum.

272. What substance is threshold substance?

Variant of answers:

a) protein;
b) glucose;
c) creatinine;
d) inulin.

273. What substance has no threshold at excretion by kidneys?

Variant of answers:

a) urea;
b) glucose;
c) creatinine;
d) inulin.

274. What reaction (pH) urine at the healthy person can have?

Variant of answers:

a) sour;
b) neutral;
c) all answers are correct;
d) alkaline.

275. How many primary urine is formed per day?

Variant of answers:

a) 15–20 l;
b) + 150–180 l;
c) – 1,5–2 l;
d) – 30–40 l.

276. How will daily amount of urine change at decrease of oncotic pressure of plasma?

Variant of answers:

a) will decrease;

b) will increase;
c) will not change.

277. The basic homeostatic function of kidneys is the maintenance of the constancy of …

Variant of answers:

a) body temperature, proteins of plasma of blood;
b) amount of leukocytes, thrombocytes, pressure of the ultrafiltrate;
c) oncotic pressure, the level of nutrients in blood;
d) oncotic pressure, acid-alkaline balance, arterial pressure.

278. Formation of final urine is the result of …

Variant of answers:

a) filtration, reabsorption, active transport;
b) filtration, reabsorption, pinocytosis;
c) filtrations, reabsorption, tubular secretion;
d) filtration, adsorption.

279. The process of formation of primary urine in capsule of Shymlanski-Boymen is named…

Variant of answers:

a) tubular excretion;
b) tubular reabsorption;
c) tubular secretion;
d) glomerular filtration.

280. Formation of primary urine from plasma of blood is the function of …

Variant of answers:

a) proximal tubules of nephron;
b) capillaries of renal glomerulus;
c) distal tubules of nephron;
d) collective tubules of nephron.

281. What parameter depends on the size of lumens of afferent and efferent arterioles and on permeability of membranes of capillaries of renal glomerulus?

Variant of answers:

a) oncotic pressure;
b) secretion;
c) filtration;
d) reabsorption.

282. How the formed glomerular filtrate is named?

Variant of answers:

a) final urine;
b) secondary urine;
c) coefficient of purification;
d) primary urine.

283. The process of returning of some filtered substances from primary urine into blood is named…

Variant of answers:

a) tubular secretion;
b) tubular reabsorption;
c) glomerular filtration;
d) adsorption.

284. What substance is reabsorbed along all nephron except for the ascending part of loop of Henle?

Variant of answers:
a) glucose;
b) protein;
c) ions of sodium and potassium;
d) water.

285. Formation of primary urine is the result of …

Variant of answers:
a) filtration, reabsorption;
b) filtration, reabsorption, secretion;
c) filtration.

286. Proteins are reabsorbed in …

Variant of answers:
a) the descending part of loop of Henle;
b) the ascending part of loop of Henle;
c) proximal tubules of nephron;
d) distal tubules of nephron.

287. Activation of antidiuretic mechanism occurs at …

Variant of answers:
a) excessive water intake;
b) reception of salty food, loss of water;
c) reception of sour food;
d) reception of spicy food.

288. Angiotensin causes …

Variant of answers:
a) decreasing of the production of aldosteron, dilatation of vessels;
b) activation of the formation of renin;
c) increasing of the production of aldosteron, constriction of vessels.

289. Specific cells-osmoreceptors are situated in …

Variant of answers:
a) hypophysis;
b) hypothalamus;
c) cortex of cerebrum;
d) thalamus.

290. At what in afferent arteriole of renal glomerulus will the increase of production of renin happen?

Variant of answers:
a) at sharply increased, then sharply decreased;

b) increased;
c) decreased hydrostatic pressure.

291. How does daily amount of urine change at intensive physical exercise?

Variant of answers:

a) increases;
b) decreases;
c) does not change.

292. At what volume of urine in the urine bladder will the first desires for urination appear?

Variant of answers:

а) 300 ml;
б) 150 ml;
в) 500 ml.

293. How the termination of formation of urine is named?

Variant of answers:

a) proteinuria;
b) glucoseuria;
c) polyuria;
d) anuria.

294. The physiological role of renin consists in …

Variant of answers:

a) maintenance of normal amount of blood cells;
b) regulation of arterial pressure;
c) coagulation of blood;
d) regulation of vitamin D.

295. How the increased amount of excreted urine is named?

Variant of answers:

a) proteinuria;
b) glucoseuria;
c) polyuria;
d) anuria.

296. The secretory function of glands of gastrointestinal tract mainly consists in…

Variant of answers:

a) excretion of heavy metals, some medicines, alien organic substances;
b) excretion of water, inorganic and organic substances, end-products of metabolism.

297. How does amount of excreted urine change at action of vasopressin?

Variant of answers:

a) increases;

b) decreases;
c) does not change.

298. Para-aminohippuric acid is used for definition of renal blood flow because …

Variant of answers:

a) walls of renal tubules are impenetrable for it;
b) it is fully reabsorbed and does not pass into secondary urine;
c) it is filtered, completely secreted and not reabsorbed into blood.

299. What part of nephron is almost completely impenetrable for water?

Variant of answers:

a) proximal convoluted tubule;
b) descending part of loop of Henle;
c) ascending part of loop of Henle;
d) collective tubules.

300. Work of an artificial kidney is based on …

Variant of answers:

a) the reflex mechanism of regulation;
b) the endocrine mechanism of regulation;
c) the hemodialysis through the partially permeable membrane.

UNITE 7

PHYSIOLOGY OF EXCITABLE TISSUES

301. Minimal force of irritant, capable to cause excitation, is called…

Variant of answers:

a) subthreshold;
b) superthreshold;
c) threshold;
d) submaximal.

302. Minimal time, during which should operate irritant with size in one reobase to cause excitation, is called…

Variant of answers:

a) chronoxy;
b) reobase;
c) available time;
d) electrotone.

303. Minimal time, during which irritant with size in two reobase should influence to cause excitation, is called…

Variant of answers:

a) reobase;
b) time of reaction;
c) available time;
d) chronoxy.

304. Tissues, capable to respond to action of irritant with active physiological reaction are called …

Variant of answers:

a) relaxable;
b) contractive;
c) excitable;
d) conductive.

305. Excitable tissues are…

Variant of answers:

a) muscular;
b) nervous;
c) glandular;
d) all answers are correct.

306. The threshold of irritation of tissue is its criterion of …

Variant of answers:

a) + excitability;
b) – inhibition.

307. Change of membrane potential in less electronegative direction is called …

Variant of answers:

a) hyperpolarization;
b) repolarization;
c) exaltation;
d) depolarization.

308. Change of membrane potential in more electronegative direction is called …

Variant of answers:

a) hyperpolarization;
b) repolarization;
c) exaltation;
d) depolarization.

309. In cytoplasm of cells of excitable tissues in condition of rest concentration of ions … is higher

Variant of answers:

a) potassium;
b) chlorine;
c) sodium;
d) calcium.

310. The active mechanism providing removing from cell of ions of sodium and introduction into it of potassium ions, is called …

Variant of answers:

a) sodium selective pump;
b) membrane action potential;
c) critical level of depolarization;
d) sodium-potassium pump.

311. What is typical for process of conduction of signal in nerves?

Variant of answers:

a) anatomical and physiological integrity;
b) conduction in two directions;
c) isolation of signal conduction;
d) all answers are correct.

312. Difference of charges between cytoplasm and an environment is called…

Variant of answers:

a) membrane action potential;
b) local response;

c) membrane resting potential;
d) reversal.

313. In phase of membrane depolarization action potential permeability of membrane increases basically for ions …

Variant of answers:
a) potassium;
b) chlorine;
c) sodium;
d) magnesium;
e) all answers are correct.

314. Excitability in the phase of negative afterpotential is characterized …

Variant of answers:
a) absolute refractory;
b) supernormal excitability;
c) relative refractory;
d) subnormal excitability.

315. The adjisting of rhythm is…

Variant of answers:
a) decrease of lability of tissue during rhythmic irritation;
b) decrease of excitability of tissue during rhythmic irritation;
c) increase of lability of tissue during rhythmic irritation.

316. Phase of repolarization of membrane action potential is caused by increase of permeability of membrane for ions …

Variant of answers:
a) potassium;
b) chlorine;
c) sodium;
d) calcium;
e) all answers are correct.

317. The mechanism of movement of ions through membrane by gradient of the concentration without energy consumption, is called …

Variant of answers:
a) passive transport;
b) pinocytosis;
c) endocytosis;
d) active transport.

318. The mechanism of movement of ions through membrane against the concentration gradient with energy consumption, is called …

Variant of answers:
a) passive transport;
b) pinocytosis;

c) endocytosis;
d) active transport.

319. Minimal time, during which irritant equal to one reobase should influence to cause excitation, is called …

Variant of answers:
a) reobase;
b) accommodation;
c) useful time;
d) adaptation.

320. What carries out the insulated and trophic function in myelinated nervous fibre?

Variant of answers:
a) neurofibrils;
b) microtubulus;
c) membrane of axon;
d) myelinic membrane.

321. Excitation in unmyelinated isolated nervous fibres is conducted…

Variant of answers:
a) stepwise;
b) continuously and all fiber at once is seized with excitation;
c) in direction of axoplasm movement.

322. Excitation in myelinic isolated nervous fibres is conducted …

Variant of answers:
a) continuously and all fiber at once is seized with excitation;
b) in skips and all fiber at once is not seized by excitation.

323. What phase corresponds to phase of fast depolarization of membrane action potential?

Variant of answers:
a) supernormal excitability;
b) subnormal excitability;
c) absolute refractory;
d) relative refractory;
e) hypererethism.

324. What corresponds to positive afterpotential?

Variant of answers:
a) supernormal excitability;
b) subnormal excitability;
c) absolute refractory;
d) relative refractory;
e) hypererethism.

325. Rate of signal condaction by myelinic nervous fibres in comparison with unmyelinated is…

Variant of answers:
a) smaller;

b) identical;

c) big.

326. Correct order of phases of changes of excitability during excitation is:

Variant of answers:

a) hyperexcitability — absolute refractory — relative refractory — subnormal excitability — supernormal excitability;

b) hyperexcitability — relative refractory — absolute refractory — subnormal excitability — supernormal excitability;

c) hyperexcitability — absolute refractory — relative refractory — supernormal excitability — subnormal excitability.

327. At development of slow depolarization of membrane action potential excitability are…

Variant of answers:

a) absolute refractory;

b) subnormal excitability;

c) relative refractory;

d) hyperexcitability.

328. Why does the phenomenon «pessimum» appear?

Variant of answers:

a) as result of getting of each following irritant into the refractory phase;

b) as result of getting of each following irritant into the phase of supernormal excitability;

c) as result of getting of each following irritant into the phase of hyperexcitability.

329. Parabiosis is..

Variant of answers:

a) local long condition of excitation, arising under action of narcotic and other substances;

b) dependence between force of irritant and time of its action;

c) passive transport with the help of the specialized structures.

330. Correct order of development of phases of parabiosis is…

Variant of answers:

a) inhibitory, equaling, paradoxical;

b) paradoxical, inhibitory, equaling;

c) equaling, paradoxical, inhibitory.

331. What happen with charge of membrane during the process of it's depolarization?

Variant of answers:

a) increase of negative charge of internal surface of membrane;

b) increase of positive charge of external surface of membrane;

c) change of negative charge to positive.

332. Sodium-potassium pump moves ions Na^+ and K^+ through membrane of cell …

Variant of answers:

a) by their concentration gradients;

b) without taking into account of their concentration gradients;

c) against their concentration gradients;

d) by osmotic gradient.

333. What is «absolute refractory period»?

Variant of answers:

a) gradual increase of excitability;

b) decrease of excitability during the period of hyperpolarization;

c) the period of full unexcitability.

334. Relative refractory period develops during the phase of…

Variant of answers:

a) depolarization;

b) hyperpolarization;

c) fast repolarization.

335. Measure of lability is…

Variant of answers:

a) the minimal force of irritant, necessary to cause excitation;

b) minimal time, with which irritant with force equal to threshold should act to cause response;

c) maximum amount of signals which the cell can produce for 1 second according to frequency of irritant.

336. Correct order of phases of membrane action potential is:

Variant of answers:

a) slow depolarization — fast depolarization — fast repolarization — hyperpolarization — slow repolarization;

b) slow depolarization — fast depolarization — fast repolarization — slow repolarization — hyperpolarization;

c) fast depolarization — slow repolarization — slow depolarization — fast repolarization — hyperpolarization.

337. What appears on postsynaptic membrane under the influence of excitatory neurotransmitters?

Variant of answers:

a) inhibitory postsynaptic potential;

b) excitatory postsynaptic potential;

c) inhibition of excitatory postsynaptic potential.

338. One-direction transmission of signals, synaptic delay, low lability, increased fatiguability, transformation of excitation rhythm, high sensitivity to drug and poisons is typical for…

Variant of answers:

a) electric synapse;

b) mixed synapse;

c) chemical synapse.

339. How does poison of curare influence on synaptic impulsing?

Variant of answers:

a) it facilitates interactions with cholinergic receptor postsynaptic membrane;

b) there is a blockade of cholinergic receptor of postsynaptic membranes.

340. Processes of tiredness of neuromuscular preparation the more early develops in…

Variant of answers:

a) synapse;

b) skeletal muscle;

c) nerve trunk.

UNITE 8

PHYSIOLOGY OF MUSCLES

341. How the amplitude of single muscular fiber contraction will depend on the force of irritation (threshold or superthreshold)?

Variant of answers:

a) the amplitude will be more at influence of superthreshold irritant;

b) the amplitude will be less at influence of superthreshold irritant;

c) the amplitude will be identical in both cases.

342. Ability of automatism, lower resting potential, rather slow and long tonic contraction is typical for…

Variant of answers:

a) smooth muscles;

b) skeletal muscles;

c) cardiac musle;

d) all kinds of muscles.

343. «Red» muscular fibres are characterized by …

Variant of answers:

a) small amount of myoglobine and glycogen, low tiredness;

b) big amount of myoglobine and glycogen, low tiredness, prevalence of aerobic processes.

344. «White» muscular fibres are characterized by …

Variant of answers:

a) strong, but quickly tired myofibrils, expressed anaerobic processes;

b) big amount of myoglobine and glycogen, low tiredness, prevalence of aerobic processes.

345. What inhibits binding of myosin with actin?

Variant of answers:

a) actin;

b) heavy meromyosin;

c) tropomyosin.

346. In what phase of single muscle contraction it is necessary to influence by the next irritation in order to get smooth tetanus?

Variant of answers:

a) during the latent period;

b) during the period of shortening;

c) during relaxation.

347. In what phase of single muscular contraction it is necessary to influence bye next irritation in order to get dentate tetanus?

Variant of answers:

a) during the latent period;

b) during the period of shortening;
c) during relaxation.

348. Force of muscle is …

Variant of answers:

a) weight of the maximal load lifted on height;
b) the maximal rate with which the muscle can be contracted;
c) both answers are correct.

349. What is typical for isometric contraction?

Variant of answers:

a) muscle changes its strain but does not change length;
b) muscle is shortened but does not change its strain.

350. What is typical for isotonic contraction?

Variant of answers:

a) muscle changes its strain but does not change length;
b) muscle is shortened but does not change its strain.

351. What tetanus has more amplitude?

Variant of answers:

a) smooth;
b) dentate.

352. What rhythm of muscle work is called optimum?

Variant of answers:

a) when work will be the maximal;
b) rhythm at which the maximum amount of energy is consumpted;
c) rhythm at which the maximal force of muscles develops.

353. Does the force of contractions of cardiac muscle depend on force of irritant?

Variant of answers:

a) yes;
b) no.

354. Muscle contraction with it's constant length is called…

Variant of answers:

a) isometric;
b) isotonic;
c) auxotonic.

355. What ions are released from sarcoplasmic reticulum at excitation?

Variant of answers:

a) potassium;
b) chlorine;
c) sodium;

d) calcium;
e) all answers are correct.

356. In what variant the correct order of phases of single muscle contraction is named?

Variant of answers:
a) phase of relaxation, shortening phase, latent phase;
b) shortening phase, phase of relaxation, latent phase;
c) latent phase, shortening phase, phase of relaxation.

357. Auxotonic (mixed) contraction is characterized by…

Variant of answers:
a) constancy of muscular strain at it's shortening;
b) constancy of length of muscle at the increasing of size of muscle strain;
c) change strain and lengths of muscle.

358. Why does smooth tetanus arise at rhythmic stimulation of muscles with the big frequency?

Variant of answers:
a) incomplete summation of single muscular contractions occurs
b) complete summation of contractions of single muscular fibres occurs.

359. At what loadings the muscle is capable to perform the maximal work?

Variant of answers:
a) minimal;
b) maximal;
c) average.

360. Motor unit is …

Variant of answers:
a) group of quickly contractile muscular fibres;
b) group of quickly and slowly contractile muscular fibres;
c) motoneuron and the group of muscular fibres innervated by it.

361. The relaxation of muscle is caused by…

Variant of answers:
a) releasing of Ca^{2+} from sarcoplasmic reticulum;
b) blocking of ATPase;
c) active transport of Ca^{2+} into sarcoplasmic reticulum.

362. Energy of ATP is used in muscle for …

Variant of answers:
a) work of Na^{+}-K^{+}-pump;
b) process of «sliding» of actin and myosin of threads;
c) all answers are correct;
d) work of calcium pump.

363. Contraction of muscle with long intervals between stimulus is called…

Variant of answers:
a) smooth tetanus;

b) dentate tetanus;
c) single contraction.

364. Contraction of muscle at its frequent irritation is called…

Variant of answers:

a) tetanus;
b) single contraction;
c) pessimum;
d) optimum.

365. In what variant the correct order of the events which lead to contraction of muscular fiber is named?

Variant of answers:

a) irritation — origin of action potential — conduction of action potential deep into fibres by cross-section tubules — release of calcium from sarcoplasmic reticulum — interaction between actin and myosin threads;

b) irritation — origin of action potential — its conduction along cell membrane — conduction of action potential deep into fibres by cross-section tubules — interaction between actin and myosin threads.

366. What will happen with muscular tonus after transection of ventral roots of spinal cord?

Variant of answers:

a) disappearance;
b) practically will not change;
c) tonus of extensor will increase.

367. What will happen with muscular tone after transection of dorsal roots of spinal cord?

Variant of answers:

a) disappearance;
b) practically will not change;
c) decrease.

368. What changes at auxotonic muscular contraction?

Variant of answers:

a) tonus of muscle;
b) tonus and length of muscle;
c) length of muscle.

369. Force of contraction of muscle depends on…

Variant of answers:

a) anatomic diameter of muscle;
b) physiological diameter of muscle;
c) both answers are correct.

370. Ability of muscle to keep the given length without change of stran is called…

Variant of answers:

a) automatism of muscles;

b) plasticity of muscle;
c) excitability.

UNITE 9

GENERAL PHYSIOLOGY OF THE CENTRAL NERVOUS SYSTEM

371. What is the role of synapses of CNS?

Variant of answers:

a) they are the place of origin of excitation in CNS;
b) they form membrane resting potential of neuron;
c) conduction of excitation from one neuron to another.

372. When will response come if in reflex arch receptors will be blocked?

Variant of answers:

a) after 1–3 second;
b) after 5–7 second;
c) response will not come;
d) after 2–5 second.

373) Ability of neuron to make many synaptic connections with various nervous cells is called…

Variant of answers:

a) convergence;
b) prolongation;
c) divergence;
d) summation;
e) transformation of rhythm.

374. The junction of various ways to the same nervous cell is called…

Variant of answers:

a) convergence;
b) prolongation;
c) divergence;
d) summation;
e) transformation.

375. Physiological process at which excitation of presser department of vasomotor center is accompanied by its depression depressor department is called…

Variant of answers:

a) convergence;
b) reciprocal inhibition;
c) divergence;
d) summation;
e) transformation of rhythm.

376. Localization and functional value of Renshaw cells are…

Variant of answers:
a) – cortex of cerebrum, stimulating action
b) – cerebellum, coordination of complex motion activity
c) + spinal cord, inhibiting action on motoneurons
d) – medulla, ensure the functioning of vasomotor center

377. What reflexes have the minimum duration time ?
Variant of answers:
a) secretory;
b) vasomotor;
c) viscerovisceral;
d) tendinous.

378. Orbeli-Genethynsky's phenomenon consists in…
Variant of answers:
a) in decrease of capacity for work and excitability of the tired muscle by influence of irritation of sympathetic fibres;
b) in increase of capacity for work and excitability of the tired skeletal muscle by influence of irritation of sympathetic nerves;
c) in atrophy of skeletal muscle.

379. What role does inhibition play in work of the nervous centers?
Variant of answers:
a) it switches the reflex arch in response to irritation;
b) it stimulates work of the nervous centers;
c) it carries out protective, regulating and coordinating functions.

380. What is the basic physiological functions of neuroglia?
Variant of answers:
a) support, trophic, insulating;
b) maintenance of process of the central inhibition.

381. With increase of irritation force time of reflex reaction …
Variant of answers:
a) decreases;
b) does not change;
c) increases.

382. At tiredness time of reflex …
Variant of answers:
a) decreases;
b) does not change;
c) increases.

383. Time of reflex is estimated from the moment of influence of irritant up to …
Variant of answers:

a) occurrences of response;
b) the terminations of its action;
c) the terminations of response.

384. What is reverberation?

Variant of answers:

a) chaotic distribution of excitation in CNS;
b) increase or reduction of number of signals in the closed neural network;
c) all answers are correct;
d) long circulation of nervous signals on the closed neural network.

385. Excitatory postsynaptic potential is the result of local …

Variant of answers:

a) hyperpolarization;
b) depolarization;
c) all answers are correct.

386. Due to what one neuron can receive signals from several afferent neurons?

Variant of answers:

a) convergence;
b) afferent synthesis;
c) consequent summation;
d) divergence.

387. Space summation of signals is provided by…

Variant of answers:

a) divergence;
b) presence of a feedback;
c) convergence;
d) all answers are correct.

388. How weaker effect of simultaneous action of two strong afferent signals, than the sum of their separate effects is called?

Variant of answers:

a) inhibition;
b) occlusion;
c) lowering transformation;
d) convergence.

389. Presynaptic inhibition develops in…

Variant of answers:

a) axo-somatic synapse;
b) somatosomatic synapse;
c) axoaxonic synapse;
d) axodendritic synapse.

390. Inhibition of neurons by their own impulses which come by axon collaterals to inhibiting cells is called?

Variant of answers:
a) reciprocal;
b) forward;
c) reverse;
d) lateral.

391. What properties does dominant have?
Variant of answers:
a) hyperexcitability;
b) inertia;
c) all answers are correct;
d) ability to sum up excitation.

392. Space summation in the nervous center is caused by…
Variant of answers:
a) simultaneous excitation of several close located synapses;
b) increase in frequency of impulses;
c) signals can go in own direction;
d) all answers are correct.

393. Time summation in the nervous center is caused by…
Variant of answers:
a) simultaneous excitation of several close located synapses;
b) increase in frequency of impulses;
c) signals can go in own direction;
d) al answers are correct.

394. Inhibition in CNS is …
Variant of answers:
a) active nervous process resulting in weakening or depressing of excitation;
b) the passive process connected with development of tiredness.

395. Reflex is…
Variant of answers:
a) the response of organism to action of irritants with participation of CNS;
b) the response of organism to action of irritant without participation of CNS.

396. Properties of synapses are…
Variant of answers:
a) maintenance of functional contacts between the nervous center and organ;
b) all answers correct;
c) promote regulated activity of CNS;
d) participation in formation of memory;
e) plasticity.

397. Interaction of neurons, and, hence, and nervous processes is called…
Variant of answers:

a) coordination;
b) plasticity;
c) divergence.

398. Inhibition at which the same afferent fibres cause excitation of one group of neurons and inhibition of another group of neurons is called…

Variant of answers:
a) pessimal;
b) reciprocal;
c) antidromic.

399. Structural basis of presynaptic inhibition is…

Variant of answers:
a) axoaxonic synapse;
b) axo-somatic synapse;
c) axodendritic synapse.

400. Excitation through the nervous centers is distributed faster, than on nervous fibres.

Variant of answers:
a) yes;
b) no;
c) it is identical.

UNITE 10

PARTICULAR PHYSIOLOGY OF CENTRAL NERVOUS SYSTEM

401. How the reflexes providing balance at change of speed and direction of movement are called?

Variant of answers:

a) static;
b) statokinetic;
c) vegetative.

402. Because of what department of CNS in experiment is sharp decreasing of muscular tonus observed?

Variant of answers:

a) thalamus;
b) spinal;
c) medulla.

403. At damage of cerebellum it is not observed …

Variant of answers:

a) infringements of coordination of movement;
b) losses of consciousness;
c) changes of muscular tonus;
d) vegetative disturbances.

404. Reflex arches of what reflexes are not situated in spinal cord?

Variant of answers:

a) elbow;
b) plantar;
c) straighttening of body;
d) urination.

405. Functions of what part of cortex of cerebrum will be affected at haemorrhage in area of temporal lobe?

Variant of answers:

a) primary acoustical cortex;
b) primary visual cortex;
c) primary somatosensory cortex;
d) primary motor cortex.

406. Medial geniculate bodes transfer impulses into cortical center of…

Variant of answers:

a) visual analyzer;

b) acoustic analyzer;
c) motor analyzer;
d) pain analyzer.

407. What structure of CNS have activation influence on cerebral cortex?

Variant of answers:

a) hypothalamus;
b) reticular formation;
c) subcortical nucleus.

408. What organs do not have parasympathetic innervation?

Variant of answers:

a) lungs, liver, kidneys, adrenal glands;
b) salivary glands, stomach, small intestine, spleen;
c) skeletal muscles, CNS, the most part of blood vessels, uterus, sweat glands;
d) pancreas , bronchi, heart, oesophagus.

409. What departments of CNS have the direct relation to maintenance of pose, mastication, swallowing, secretion of digestive glands, respiration, activity of heart, regulation of tone of vessels?

Variant of answers:

a) mesencephalon;
b) thalamus;
c) afterbrain;
d) spinal cord.

410. Sympathetic and parasympathetic departments of vegetative nervous system are in relations of …

Variant of answers:

a) full synergism;
b) full antagonism;
c) relative antagonism and synergism.

411. Orientation, visual and acoustical reflexes are regulated by…

Variant of answers:

a) afterbrain;
b) thalamus;
c) mesencephalon;
d) cerebellum;
e) spinal cord.

412. What appears at animal after transaction of brainstem below the level of red nucleus and how this influence on the tone of extensor muscles?

Variant of answers:

a) decerebrate rigidity, the tonus of extensor sharply raises;
b) muscular atrophy, tonus of extensor sharply raises.

413. At affection of what department of CNS the patient will have ataxy, atony, astasia, adiadochokinesia, asynergia?

Variant of answers:
a) thalamus;
b) spinal cord;
c) afterbrain;
d) cerebellum.

414. Why normal functioning of medulla is vitally important?
Variant of answers:
a) the centers of tonic reflexes are located in it;
b) the centers of respiratory and cardiovascular are located in it;
c) the centers of salivation and swallowing are located in it.

415. What spinal roots are damaged at an animal if it has full absence of motor reactions on the right side of the body and keeping of all kinds of sensitivity on both sides?
Variant of answers:
a) ventral root of spinal nerve from the right;
b) dorsal root of spinal nerve from the left.

416. Functional zones of cerebral cortex are…
Variant of answers:
a) only sensory;
b) only motor;
c) motor and sensory;
d) motor, sensory and associative.

417. Functions of what zone of cerebral cortex will be affected at an extensive haemorrhage in area of occipital cortex?
Variant of answers:
a) primary acoustical;
b) primary visual;
c) primary motor.

418. What functions of an organism do not concern to vegetative functions?
Variant of answers:
a) digestive;
b) blood circulations;
c) respiration;
d) excretion;
e) motor, carried out by smooth muscles;
f) motor, carried out by skeletal muscles.

419. Metasympathetic nervous system …
Variant of answers:
a) all answers are correct;
b) possesses relative independence;

c) it is located in walls of internal organs;

d) can regulate activity of internal organs by means of peripheral reflex arches.

420. Thalamus is …

Variant of answers:

a) regulator of all motor functions;

b) regulator of muscular tone;

c) collector of afferent ways, the higher center of painful sensitivity.

421. The basic function of quadrigeminal plate of midbrain is…

Variant of answers:

a) regulation of homeostasis of all vegetative functions;

b) realization of orientation reactions on acoustical and visual irritants;

c) regulation of muscular tonus;

d) participation in mechanisms of memory.

422. The basic function of black substance of midbrain is…

Variant of answers:

a) participation in complex coordination of movements and regulation of muscles tonus;

b) participation in mechanisms of memory;

c) regulation of biorhythms;

d) center of painful sensitivity.

423. Lateral geniculate bodies transfer impulses into cortical center of…

Variant of answers:

a) visual analyzer;

b) skin analyzer;

c) acoustic analyzer;

d) painful analyzer.

424. What is the higher subcrustal center of VNS and all major vegetative functions?

Variant of answers:

a) cerebellum;

b) hypothalamus;

c) medulla.

425. Alpha rhythm of electroencephalography is registered at the person at …

Variant of answers:

a) active mental work;

b) at rest and absence of secondary irritants;

c) falling asleep.

426. Viscerodermal reflexes arise at irritation of internal organs and can result in …

Variant of answers:

a) both answers are correct;
b) change of sweat secretion;
c) change of skin sensitivity.

427. Centers of parasympathetic nervous system are located in...

Variant of answers:

a) department of spinal cord and reticular formation;
b) sacral department of spinal cord and medulla;
c) basal nucleus.

428. Beta rhythm of electroencephalography is registered at the person at …

Variant of answers:

a) active mental work;
b) at rest and absence of secondary irritants;
c) falling asleep.

429. At affection of primary projective zones of the visual analyzer in cerebral cortex the person …

Variant of answers:

a) loses sight;
b) sees the image, but does not learn and does not understand value of signals.

430. Division of VNS into departments is based on…

Variant of answers:

a) all answers are correct;
b) on localizations of the centers in brain;
c) on character of influence on function of organs;
d) on excreted mediator;
e) on location of ganglions in which nervous ways are interrupted.

UNITE 11

PHYSIOLOGY OF ENDOCRINE SYSTEM

431. How does antidiuretic hormone influence on the permeability of collective tubules of nephron for water?

Variant of answers:

a) decreases;
b) increases;
c) does not change.

432. How does antidiuretic hormone influence on diuresis?

Variant of answers:

a) decreases;
b) increases;
c) does not change.

433. How do the big dozes of adrenaline influence on formation of urine?

Variant of answers:

a) decrease;
b) increase;
c) do not change.

434. How does adrenaline influences on a pupil?

Variant of answers:

a) narrows;
b) expands;
c) does not influence.

435. How does aldosterone influences on the formation of urine?

Variant of answers:

a) decreases the reabsorption of Na + into blood;
b) increases the reabsorption of Ca^{2+} into blood;
c) increases the reabsorption of Na + into blood.

436. What hormone stimulates synthesis of proteins in muscles?

Variant of answers:

a) parathormone;
b) somatotropin;
c) antidiuretic hormone.

437. What hormone decreases the level Ca^{2+} in blood?

Variant of answers:
a) parathormone;
b) thyroxin;
c) thurocalcitonin.

438. What hormone stimulates gluconeogenesis?
Variant of answers:
a) cortisol;
b) aldosterone;
c) oxytocin.

439. What hormone decreases the secretion of gastric juice?
Variant of answers:
a) prolactin;
b) noradrenalin;
c) thyroxin.

440. What hormone stimulates lactation?
Variant of answers:
a) parathormone;
b) aldosterone;
c) prolactin.

441. What hormone stimulates contraction of uterus?
Variant of answers:
a) oxytocin;
b) progesterone;
c) somatotropin.

442. What hormone decreases the level of glucose in blood?
Variant of answers:
a) thyroxin;
b) estradiol;
c) insulin;

443. What hormone decreases the motor activity of intestines?
Variant of answers:
a) luteinizing hormone;
b) noradrenalin;
c) glucagons.

444. What hormone has the anti-inflammatory effect?
Variant of answers:
a) hydrocortisone;
b) aldosterone;
c) thyroxin.

445. What hormone influences on the pigmentation of skin?

Variant of answers:
a) thyrotropin;
b) prolactin;
c) melanotropin.

446. What hormone stimulates synthesis of proteins in the liver?
Variant of answers:
a) follicle-stimulating hormone;
b) adrenaline;
c) cortisol;

447. What hormone stimulates growth of a bone tissue?
Variant of answers:
a) somatotropin;
b) parathormone;
c) adrenaline.

448 What hormone provides sexual behavior of men?
Variant of answers:
a) aldosterone;
b) testosterone;
c) insulin.

449. What hormone stimulates synthesis of estrogens?
Variant of answers:
a) thyrotropin;
b) somatotropin;
c) follicle-stimulating hormone.

450. What hormone stimulates synthesis of progesterone?
Variant of answers:
a) prolactin;
b) luteinizing hormone;
c) thyrotropin.

451. What hormone stimulates synthesis of glucocorticoids?
Variant of answers:
a) luteinizing hormone;
b) corticotropin;
c) antidiuretic hormone.

452. Where are tropic hormones formed?
Variant of answers:
a) in hypothalamus;
b) in hypophysis;
c) in adrenal glands.

453. What endocrine gland produces a hormones which influence on the level of glucose in blood?

Variant of answers:
a) parathyroid gland;
b) pancreas;
c) parotid gland.

454. What endocrine gland produces a hormone which influence on the mineral exchange?
Variant of answers:
a) thymus;
b) ovary;
c) adrenal glands.

455. What hormones participate in regulation of protein exchange?
Variant of answers:
a) adrenocorticotropic hormone, antidiuretic hormone, parathormone;
b) aldosterone, glucagon, prolactin;
c) testosteron, insulin, somatotropin, estrogens, thyroid hormones.

456. What hormones are produced by a thyroid gland?
Variant of answers:
a) somatotropin, thyrotropin;
b) estriol, progesterone;
c) thyroxin, calcitonin.

457. What hormones are produced by ovaries?
Variant of answers:
a) somatotropin, thyrotropin;
b) estriol, progesterone;
c) thyroxin, calcitonin.

458. How does thyroxin influences on metabolism?
Variant of answers:
a) increases the basal metabolism;
b) decreases the basal metabolism;
c) does not influence on metabolism.

459. What hormones are produced in the anterior lode of hypophysis?
Variant of answers:
a) oxytocin, vasopressin, melanotropin;
b) somatotropin, corticotropin – follicle-stimulating hormone;
c) prolactin, luteinizing hormone, lipotropin.

460. The production of what hormones does luteinizing hormone?
Variant of answers:
a) prolactin, progesterone;
b) glucocorticoids;
c) mineralocorticoids.

461. Where is the natriuretic hormone produced?
Variant of answers:

a) in the posterior lode of hypophysis;
b) in the right atrium of heart;
c) in hypothalamua;
d) in placenta.

462. The basic result of action of vasopressin is stimulation of…

Variant of answers:

a) reabsorption of waters;
b) reabsorption of potassium;
c) reabsorption of ions H +.

463. What hormones increases the level of glucose in blood?

Variant of answers:

a) parathormone, prolactin;
b) thyroxin, cortisol, adrenaline, glucagon;
c) aldosterone, insulin, calcitonin.

464. If the patient has the increases of the basal metabolism on 45%, then most likely this patient has the increases of function of

Variant of answers:

a) epiphysis;
b) beta cell of pancreas;
c) cortical layer of adrenal glands;
d) thyroid gland.

465. How somatotropin provides activization of plastic processes in an organism?

Variant of answers:

a) increases transport of amino acids into cells;
b) increases synthesis of protein on ribosomes;
c) activates synthesis of DNA, RNA;
d) all answers are correct.

466. The lack of what hormones at children's age causes the inhibition of growth, a disproportionate constitution, the delay of intellectual development?

Variant of answers:

a) thyroxin, triiodthyronine;
b) parathormone;
c) adrenaline.

466. The lack of what hormones at children's age causes the inhibition of growth without disproportionate constitution and without the delay of intellectual development?

Variant of answers:

a) thyroxin, triiodthyronine;
b) somatotropin;
c) parathormone.

467. The atrophy of the cortical layer of adrenal glands causes the development of…

Variant of answers:

a) Addison's diseases;

b) Basedow's diseases;

c) myxedema;

d) Icenco-Cuching's diseases.

468. The increases of function of a thyroid gland in adults causes the development of…

Variant of answers:

a) Addison's diseases;

b) Basedow's diseases;

c) myxedema;

d) Icenco-Cuching's diseases.

469. The decreases of function of thyroid gland in adults causes the development of…

Variant of answers:

a) Addison's diseases;

b) Basedow's diseases;

c) myxedema;

d) Icenco-Cuching's diseases.

470. The increase of the level contents of glucocorticoids leads to decreasing of production of adrenocorticotropic hormone by adenohypophysis, and this is an example of…

Variant of answers:

a) a positive feedback;

b) a negative feedback;

c) starting action.

471. Receptors of hormones are localized in …

Variant of answers:

a) hemoglobin of blood;

b) in cells of target organs;

c) in endothelial cells of vessels.

472. What hormone regulates the production of glucocorticoids?

Variant of answers:

a) oxytocin;

b) somatotropin;

c) adrenocorticotropic hormone;

d) prolactin.

473. Where is oxytocin deposited?

Variant of answers:

a) in adrenal glands;

b) in a thyroid gland;

c) in adenohypophysis;

d) in neurohypophysis.

474. In the adaptation of an organism to stressful factors mainly take part such hormones as…

Variant of answers:

a) glucagon, mineralocorticoids;

b) catecholamines, glucocorticoids;

c) glucocorticoids, testosterone, estrogens.

475. What are effects of action of oxytocin?

Variant of answers:

a) stimulation of contraction of a uterus at sorts;

b) all answers are correct;

c) contraction of unstreaped muscles of ducts of mammary glands;

d) regulation of water-salt exchange and drinking behavior.

476. What endocrine gland is a place of integration of immune and э endocrine systems of an organism?

Variant of answers:

a) adenohypophysis;

b) neurohypophysis;

c) thymus;

d) adrenal glands.

477. The increase in the level of estrogens in blood causes increase in secretion of oxytocin, and this is an example of…

Variant of answers:

a) a positive feedback;

b) a negative feedback;

c) morphogenetic effect.

478. Where is oxytocin synthesized?

a) in neurohypophysis;

b) in adrenal glands;

c) in hypothalamus;

d) in a thyroid gland.

479. During sleep the level of secretion of somatotropin…

Variant of answers:

a) decreases;

b) increases;

c) does not change.

480. What kinds of action can hormones provide?

Variant of answers:

a) metabolic;

b) all answers correct;

c) morphogenetic;

d) kinetic.

UNITE 12

PHYSIOLOGY OF ANALYZER

481. Decrease of sensitivity at long action of constant stimulus is called…

Variant of answers:

a) accommodation;

b) adaptation;

c) depolarization.

482. Physiological sense of the «narrowed funnel» is…

Variant of answers:

a) in increase of divergence of signals at subcortical level;

b) in increase of speed of conducting of afferent signals;

c) in decrease of redundancy of information and increase of sensitivity of the sensory channel.

483. Physiological sense of the «extending funnel» is…

Variant of answers:

a) in limitation of amount of the incoming information;

b) in ensuring of fractional and complex analysis of different indicators of signal;

c) in detachment of the most important indicators of signal.

484. Receptor field of neuron is…

Variant of answers:

a) sum of receptors, signals from which come on given neuron;

b) sum of brain neurons, signals from which converge on given neuron.

485. Projective field of the analyzer is…

Variant of answers:

a) sum of neurons which get signals from given neuron;

b) sum of stimulating and inhibiting neurons of cortical department of analyzer.

486. What provides lateral inhibition in sensory systems?

Variant of answers:

a) decrease in redundancy of information and choice of the most significant data about signal;

b) increase of redundancy of information and detalisation of signal properties.

487. Adaptation in sensory systems results in…

Variant of answers:

a) all answers are correct;

b) in increase of activity of processes of excitation and inhibition;

c) in decrease of activity of processes of excitation and inhibition;

d) in change of sensitivity to long acting irritant.

488. Practically nonadaptive receptors are…

Variant of answers:

a) vestibulo- and proprio-;

b) acceleration, vibration (Pacinian corpuscles) ;

c) irritant.

489. Fast adaptable receptors are…

Variant of answers:

a) photo;

b) pain (nociceptor);

c) acceleration, vibration (Pacinian corpuscles).

490. Slowly adaptable receptors are…

Variant of answers:

a) vestibule-and proprio;

b) acceleration, vibration (Pacinian corpuscles);

c) pain, olfactory, pressure.

491. By the nature of an irritant all receptors are divided into…

Variant of answers:

a) vestibule-, proprio-, viscero-;

b) mechano-, thermo-, photo, chemo-;

c) vibrations, pressure, pain;

d) tactile, gustatory, viscero.

492. Interoreceptor are…

Variant of answers:

a) vestibulo-, proprio-, viscero-;

b) viscero-, photo-;

c) vestibule-, olfactory, gustatory.

493. What receptors are absent at the person?

Variant of answers:

a) chemoreceptor;

b) nociceptor;

c) thermoreceptor;

d) electroreceptors;

c) mechanoreceptors.

494. At long action of irritant adaptation of receptor is resulted in?

Variant of answers:

a) in constancy of its excitability;

b) in change of its conductivity;

c) in change of its excitability.

495. Irritant to which action the receptor is adapted during evolution, is called …

Variant of answers:
a) biological;
b) physical;
c) adequate;
d) physiological.

496. At what levels of CNS interaction of sensory systems is carried out?
Variant of answers:
a) reticular;
b) cortical;
c) all answers are correct;
d) thalamic.

497. Presence of mediator is necessary at excitation of…
Variant of answers:
a) primary - and secondary-sensitive receptors;
b) secondary-sensitive receptors;
c) primary -sensitive receptors.

498. Olfactory receptors, tactile receptors, and proprioreceptors are…
Variant of answers:
a) secondary-sensitive;
b) primary-sensitive.

499. Receptors of olfactory, visual, auditory and vestibular apparatus are…
Variant of answers:
a) secondary-sensitive;
b) primary-sensitive.

500. Detection and identification of signals is provided by neurons which are located in…
Variant of answers:
a) spinal cord;
b) cerebral cortex;
c) thalamus;
d) reticular formation.

501. Pain receptors are called…
Variant of answers:
a) osmoreceptors;
b) nociceptor;
c) proprioreceptors;
d) distant receptors.

502. Objective signs of pain are changes of …
Variant of answers:
a) blood pressure;
b) all answers are correct;
c) rhythm of heart activity;
d) rhythm of respiration;

e) leucocytic formula and amount of hormones in plasma of blood.

503. What kind of pain appears at damage of connective tissue, joints, muscles?

Variant of answers:

a) visceral pain;
b) somatic, superficial pain;
c) somatic, deep pain.

504. The greatest amount of nociceptors on unit of the area is situated in…

Variant of answers:

a) in tendons;
b) in skin;
c) in internal organs;
d) in muscles.

505. Painful sensitivity at excitation of structures of antinociceptive systems of brain will be…

Variant of answers:

a) increased;
b) sharply decreased;
c) decreased;
d) does not change.

506. Painful sensitivity at blocking of structures of antinociceptive systems of brain will be…

Variant of answers:

a) sharply decreased;
b) does not change;
c) sharply increased.

507. What substances, which are produced by antinociceptive system of brain, suppress painful sensitivity?

Variant of answers:

a) acetylcholine, histamine;
b) prostaglandins, ions of potassium;
c) endorphines, enkephalins.

508. Painful sensitivity at long action of painful stimulus is…

Variant of answers:

a) decreased;
b) increased;
c) does not change.

509. Unequal refraction of light rays in different planes of optical system of eye is called…

Variant of answers:

a) accommodation;
b) hypermetropia;
c) myopia;
d) astigmatism.

510. Adaptation of an eye to clear vision of the subjects removed on different distance is called…

a) accommodation;
b) hypermetropia;
c) myopia;
d) astigmatism.

511. Visual acuity at increase in light and physical contrast will be…

Variant of answers:
a) decreased;
b) increased;
c) does not change.

512. In color perception the basic role is played by …

Variant of answers:
a) rod;
b) cone;
c) pigmentary cells.

513. Absence of ability to distinguish separate colors is called…

Variant of answers:
a) hypermetropia;
b) myopia;
c) astigmatism;
d) daltonism.

514. Absence of ability of perception of red color is called…

Variant of answers:
a) protanopia;
b) deuternopia;
c) tritanopia;
d) tritanopia.

515. At myopia the image will be focused …

Variant of answers:
a) in the anterior chamber of eye;
b) on retina;
c) behind retina;
d) before retina.

516. At hypermetropia the image will be focused …

Variant of answers:
a) in the posterior chamber of eye;
b) on retina;
c) behind retina;
d) before retina.

517. Irritation of sympathetic fibres, which innervated iris of the eye, causes …

Variant of answers:

a) narrowing of pupil;
b) dilatation of pupil.

518. Irritation of parasympathetic fibres of oculomotor nerve causes …

Variant of answers:

a) narrowing of a pupil;
b) dilatation of pupil.

519. What property of the visual analyzer is estimated with the help of the table of Sivtsev?

Variant of answers:

a) field of vision;
b) color sensation;
c) acuity of visual.

520. The projective zone of the visual analyzer is located in …

Variant of answers:

a) parietal area of cerebral cortex;
b) temporal area of cerebral cortex;
c) occipital area of cerebral cortex;
d) frontal area of cerebral cortex.

521. If there is damage of nerve pathways of visual system, and receptor and cortical function normally, will the person be able to see and how will he see subjects surrounding it?

Variant of answers:

a) he will see only black-and-white subjects;
b) he will see normally;
c) he will see only color subjects;
d) he will not see;
e) he will see only close located subjects.

522. Absence of ability for perception of blue and violet colors is called…

Variant of answers:

a) protanopia;
b) deuternopia;
c) tritanopia;
d) achromatopsia.

523. Primary subcortical visual centers are located…

a) in superior tubers of quadrigeminal plate;
b) in inferior tubers of quadrigeminal plate.

524. Space, which can be seen by an eye at fixing in one point, is called…

Variant of answers:

a) field of vision;
b) acuity of vision;

c) accommodation;
d) myopia.

525. Receptors of what part of tongue in the best way perceive sweet taste?
Variant of answers:
a) the bases of tongue;
b) along the edges of tongue;
c) lateral surface of tongue;
d) the apex of the tongue.

526. In conditions of contraction of muscle frequency of impulses from Golgi tendinous receptors…
Variant of answers:
a) does not change;
b) changes inversely to force of contraction;
c) increase directly proportional to force of contraction.

527. Antinociceptive system is the system of structures of CNS which can…
Variant of answers:
a) inhibite pains sensation;
b) activate pains sensation.

528. What element of refractive systems of an eye has the greatest refracting force?
Variant of answers:
a) aqueous humor of the anterior chamber;
b) lens;
c) vitreous body;
d) cornea.

529. Adequate irritants of vestibuloreceptor are…
Variant of answers:
a) linear and angular acceleration;
b) only linear acceleration;
c) only angular acceleration.

530. The least force of irritant, capable to cause painful sensation is called…
Variant of answers:
a) subthreshold;
b) pain barrier;
c) indifferent.

531. For the full characteristic of position of body in space except for vestibular impulses, it is necessary to get additional information from …
Variant of answers:
a) proprio receptors of neck muscles;

b) proprio receptors of muscles extremity;
c) proprio receptors of muscles of trunk.

532. Receptors of acoustic analyzer are …

Variant of answers:

a) cells of spiral ganglion of cochlea;
b) formations of internal ear;
c) hair cells.

533. Sound-conducting structures of acoustic analyzer are…

Variant of answers:

a) tympanic membrane, auditory ossicles;
b) Eustachian tube;
c) spiral ganglion of cochlea, semicircular channels;
d) vestibulum labyrinthi and semicircular channels.

534. Area of perception of sound by acoustic analyzer of the person has borders …

Variant of answers:

a) 6–2000 Hz;
b) 16–20000 Hz;
c) 10 –2000 Hz;
d) 6–10000 Hz.

535. Mydriasis is …

Variant of answers:

a) narrowing of pupil;
b) narrowing of palpebral fissure;
c) expansion of pupil.

536. Direct cause of excitation of receptors of spiral ganglion of cochlea is…

Variant of answers:

a) deformation of hair cells;
b) deformation of tympanic membrane.

537. Thanks to binaural hearing the person can …

Variant of answers:

a) hear low tone;
b) hear high tone;
c) locate source of sound;
d) perceive sounds of any frequency.

538. The minimal spatial threshold of tactile sensitivity is on the surface of…

Variant of answers:

a) soles of legs;
b) back;
c) fingers of hands;
d) forearms.

539. Receptors of tongue which in the best way perceive bitter taste are located in…

Variant of answers:

a) along the edges of tongue;
b) the apex of the tongue;
c) the bases of tongue;
d) lateral surface of tongue.

540. The minimal tactile sensitivity is on the surface of…

Variant of answers:

a) the backside of a palm;
b) back;
c) fingers of hands.

541. Pressure of air in cavity of middle ear is approximately …

Variant of answers:

a) higher atmospheric on the 75 mm of Hg;
b) it is equal atmospheric;
c) on 75 mm of Hg below atmospheric.

542. Abnormality of vision connected with loss of elasticity of lens in middle age is called…

Variant of answers:

a) astigmatism;
b) myopia;
c) hypermetropia;
d) presbyopia.

543. Abnormality of vision connected with increase of length of eyeball is called…

Variant of answers:

a) astigmatism;
b) myopia;
c) hypermetropia;
d) presbyopia.

544. What theory of perception of sounds is considered the main now?

Variant of answers:

a) telephone theory of Rutherford;
b) resonance theory of Helmholtz;
c) the theory of «traveling wave» of Bekeshi.

545. Spiral ganglion of cochlea is located on …

Variant of answers:

a) Reissner's (vestibular) membrane;
b) basal membrane;
c) membrane of round window;

d) membrane of oval window.

546. Projective zone of acoustic analyzer is located in …

Variant of answers:

a) inferior frontal gyrus;

b) precentral gyrus;

c) postcentral gyrus;

d) superior temporal gyrus.

547. What kind of «funnel» is situated in the central acoustical system?

Variant of answers:

a) narrowed «funnel»;

b) extending «funnel»;

548. Into what cerebral hemisphere does information come from the right and left half of each retina?

Variant of answers:

a) from the right half into left, from left - into right;

b) from the right half into right, from left - into left.

549. What factor plays role in estimation of distance up to considered object?

Variant of answers:

a) the size of the image on retina;

b) degree of accommodation;

c) bipolar vision;

d) all answers are correct.

550. What neurons of retinas and the visual centers are called color-opponent?

Variant of answers:

a) all answers are correct;

b) stimulated by one color and inhibited by another;

c) stimulated by one color at switching on and inhibited at switching-off light.

UNITE 13

HIGHER NERVOUS ACTIVITY

551. Total sum of the most complicated unconditioned reflexes is called…

Variant of answers:

a) dynamic stereotype;

b) instinct.

552. By what is ability to perceive and say words, arising during social human life, provided?

Variant of answers:

a) instinct;

b) first signaling system;

c) second signaling system.

553. Owing to what inhibition does the dog stop reception of food at appearance of the new person?

Variant of answers:

a) reciprocal;

b) external;

c) conditional brake;

d) differentiating.

554. What temperament on Hippocras does the person have if he has ability to conditioned reflexes quickly and strongly?

Variant of answers:

a) choleric;

b) melancholic;

c) phlegmatic;

d) sanguine.

555. What department of CNS dominates at the analysis and synthesis of concrete signals?

Variant of answers:

a) left-brain;

b) right-brain;

c) reticular formation.

556. What department of CNS dominates at the analysis and synthesis of abstract (verbal) signals?

Variant of answers:

a) left-brain;

b) right-brain;

c) thalamus;

d) reticular formation.

557. The left-brain dominates in performance of next functions…

Variant of answers:

a) regulation of functions of the left half of body;

b) the analysis and synthesis of signals of first signaling system;

c) speech, writing and calculation.

558. The right -brain dominates in performance of next functions…

Variant of answers:

a) regulation of functions of the right half of body;

b) the analysis and synthesis of signals of first signaling system;

c) speech, writing and calculation.

559. What cerebral hemispheres and signaling system dominate at persons of «art type» by I. P. Pavlov?

Variant of answers:

a) the left cerebral hemisphere, first signaling system;

b) the right cerebral hemisphere, first signaling system;

c) the left cerebral hemisphere, second signaling system;

d) the right cerebral hemisphere, second signaling system.

560. What cerebral hemisphere and signaling system dominate at persons of «intellectual type» by I. P. Pavlov?

Variant of answers:

a) the left cerebral hemisphere, first signaling system;

b) the right cerebral hemisphere, first signaling system;

c) the left cerebral hemisphere, second signaling system;

d) the right cerebral hemisphere, second signaling system.

561. Bellow-cutoff inhibition is called…

Variant of answers:

a) late inhibition;

b) differentiating inhibition;

c) conditional brake;

d) protective inhibition;.

e) fading inhibition

562. What rhythm of electroencephalogram is characteristic for active wakefulness?

Variant of answers:

a) alpha;

b) delta;

c) beta;
d) teta.

563. What rhythm of electroencephalogram is characteristic for quiet wakefulness (at rest, eyes are closed)?

Variant of answers:

a) alpha;
b) delta;
c) beta;
d) teta.

564. What rhythm of electroencephalogram is characteristic for deep sleep?

Variant of answers:

a) alpha;
b) delta;
c) beta;
d) teta.

565. How does duration of sleep change with increase of age?

Variant of answers:

a) increases;
b) does not vary change;
c) decreases.

566. Inhibition which is produced during an individual to various irritants is called…

Variant of answers:

a) differentiating inhibition;
b) protective inhibition;
c) reciprocal inhibition;
d) conditional inhibition.

567. Conditional inhibition is…

Variant of answers:

a) reciprocal, lateral;
b) fading, differentiating, conditional brake, late;
c) protective;
d) postsynaptic, presynaptic.

568. Inhibition of reflex activity by influence of strong irritant is called...

Variant of answers:

a) differentiating;
b) conditional brake;
c) late;
d) protective.

569. What value for an organism does external and internal inhibition of conditioned reflexes have?

Variant of answers:

a) organism is protected from superthreshold irritants;

b) all answers are correct;

c) provides concentration on the most important activity;

d) activity of an organism is adapted to varying conditions of environment.

570. In what phase of sleep are dreams observed?

Variant of answers:

a) phase of slow sleep;

b) phase of fast sleep;

c) dreams do not depend on phase of sleep.

571. Who for the first time has put forward theory about reflex character of activity of the higher departments of brain?

Variant of answers:

a) I. P. Pavlov;

b) P. K. Anohin;

c) I. M. Sechenov;

d) K. M. Bykov.

572. The most exact method of definition of HNA types at animals and human is…

Variant of answers:

a) observation;

b) psychological testing;

c) self-appraisal;

d) conditioned reflexes.

573. For development of conditioned reflex, basically, it is necessary, that …

Variant of answers:

a) unconditional irritants should precede action of conditional little;

b) conditional and unconditional irritants should act simultaneously;

c) conditional irritants should precede action of unconditional little.

574. With the help of conditional mechanism blood pressure…

Variant of answers:

a) cannot changes;

b) can changes, at development of corresponding conditioned reflex.

575. Sleep is a sum of functional conditions of CNS, which…

Variant of answers:

a) is the decrease of conscious activity and decrease of reaction on irritants;

b) all answers are correct;

c) includes certain wave phases of electroencephalogram;
d) is distinguished from wakefulness and characterized by loss of consciousness.

576. Type of thinking at which the information from the first signaling system is mainly processed is called…

Variant of answers:

a) creative;
b) verbal-logical.

577. Type of thinking at which the information from the second signaling system is mainly processed is called…

Variant of answers:

a) creative;
b) verbal-logical.

578. Biological value of phase of fast sleep is…

Variant of answers:

a) activation of plastic processes in nervous system;
b) processing and keeping of the information in long-term memory, restoration of mental processes;
c) increase of sensitivity to external irritants;
d) increase in synthesis of DNA and RNA in an organism.

579. The main role of Z. Freud's in studying mental of processes is…

Variant of answers:

a) he was the first who studied conditioned reflexes;
b) he originated psychoanalysis due to which unconscious processes were included in psychology and medicine;
c) he was the first who originated the doctrine about 1 and 2 signaling system.

580. Basis of higher nervous activity is…

Variant of answers:

a) unconditioned reflexes;
b) conditioned reflexes;
c) conditional and unconditioned reflexes.

581. Reflex of eyelid closing at flash of light is…

Variant of answers:

a) conditional;
b) unconditional;
c) artificial;
d) vegetative.

582. Inhibition which is arising by influence of irritants, which are foreign for carried out reflex, is called...

Variant of answers:

a) internal;
b) external;

c) lateral;
d) reverse.

583. What types of the higher nervous activity by I. P. Pavlov are distinguished?

Variant of answers:

a) introvert, extrovert;
b)choleric person, sanguine person, phlegmatic person, melancholiac;
c) quiet, alive, impetuous, weak;
d) asthenic, hypersthenic person, normosthenic person.

584. Conditioned reflex is unconditional reinforcement at development of …

Variant of answers:

a) dynamic stereotype;
b) instinct;
c) conditioned reflex of second order;
d) orientation reflex.

585. What kind of inhibition will appear at dog if the food stimuli is given in one minute after switching on the bell?

Variant of answers:

a) conditional brake;
b) fading;
c) late;
d) differentiating.

586. What kind of inhibition is developed, if in combination with conditional irritant another conditional irritant was given and this combination is not supported?

Variant of answers:

a) conditional brake;
b) fading;
c) late;
d) differentiating.

587. To what temperament on classification by Hippocras does strong unbalanced inpatient type of system on I. P. Pavlov's classification corresponds?

Variant of answers:

a) to the phlegmatic person;
b) to the melancholiac;
c) to the sanguine person;
d) to the choleric person.

588. Conditioned reflex is…

Variant of answers:

a) acquired, constant, individual;

b) acquired, time, individual;
c) innate, constant, specific;
d) innate, time, individual.

589. Unconditioned reflex is…

Variant of answers:

a) acquired, constant, individual;
b) acquired, time, individual;
c) innate, constant, specific;
d) innate, time, individual.

590. Secretion of saliva at the hungry person at remembrance on food is…

Variant of answers:

a) unconditional reflex;
b) reflex of the second order;
c) artificial reflex;
d) conditional reflex.

591. System of the conditioned reflexes which are carried out in strictly certain sequence is called…

Variant of answers:

a) dynamic stereotype;
b) instinct;
c) – conditioned reflex of the fourth order

592. The ocular-cardiac reflex is...

Variant of answers:

a) reflex of the second order;
b) conditioned reflex;
c) unconditioned reflex;
d) somatic reflex.

593. Narrowing of pupil on light is …

Variant of answers:

a) conditioned reflex;
b) reflex of the second order;
c) unconditioned reflex;
d) somatic reflex.

594. Connection between cortical centers of conditional and unconditional reflexes is called…

Variant of answers:

a) dominating connection;
b) time connection;
c) return connection.

595. Differentiating inhibition...

Variant of answers:

a) protects the nervous centers from excess of the information;

b) allows to save power resources;
c) allows to distinguish irritants which are close by character.

596. What is the role of «the fading brake»?

Variant of answers:

a) it allows to save power resources;
b) it allows to distinguish relatives on character irritants;
c) it switches an organism to research the importance of the stranger irritants.

597. Reflex which appears during evolution and is hereditary fixated, is called…

Variant of answers:

a) dynamic stereotype;
b) unconditional;
c) conditional;
d) reflex of the second or third order.

598. Reflex, which appears in ontogenesis at condition of numerous combination of unconditional irritant with indifferent signal, is called…

Variant of answers:

a) protective;
b) spinal;
c) conditional.

599. Participation of new cerebral cortex is necessary for formation of…

Variant of answers:

a) instinct;
b) conditioned reflex;
c) unconditioned reflex.

600. Reflex of tachypnoe at runner before start is…

Variant of answers:

a) conditional;
b) statokinetic;
c) unconditional.

BASIC PHYSIOLOGIC CONSTANT

Constant of blood system

Amount of blood in adults (6-8 % of body weight)	4,5–6 l
Hematocrit (m)	0,44–0,46
(f)	0,41–0,43
Blood: deposited	45–50 %
circulating	50–55 %
Volume of blood plasma	approx. 3 l
Structure of blood plasma:	
Water	90–92 %
Solid residual	8–10 %
General protein	65–80 g/l
Albumins	45 g/l
Globulins	20–35 g/l
Fibrinogen	3 g/l
Residual nitrogen	14,3–28,5 millimole/l
Glucose (whole blood)	3,30–5,55 millimole/l
(plasma)	3,88–6,10 millimole/l
Triglycerides	0,40–1,81 millimole/l
Inorganic substances	0,9%
Viscosity of blood in adults	5
Relative density	1,050–1,060
pH of arterial bloods:	7,40
venous	7,35
pH borders compatible with life	7,0–7,8
Amount of erythrocytes: (m)	4,5–5,0 $x10^{12}$ /l (tera per litre)
(f)	3,8–4,5 $x10^{12}$ /l (tera per litre)
Amount of hemoglobin (m)	130–160 g/l
(f)	115–145 g/l
Color parameter: adults	0,8–1,0
Osmotic resistance of erythrocytes: Min	0,46–0,48 % solution of NaCI
Max	0,32–0,34 % solution of NaCI
Erythrocyte sedimentation rate (m)	1–10 mm / hr
(f)	2–15 mm / hr
Neonatal	1–2 mm / hr
Leucocytes: amount in adults	4–9 $x10^{9}$ /l (giga per litre)
in newborns	15–20 $x10^{9}$ /l (giga per litre)
The leukocytic formula (%): Neutrophils:	
Myelocytes	0
Metamyelocytes	0–1
stab neutrophil	1–5
segmentonuclear	45–70
Eosinocytes	1–5
Basophils	0–1

Lymphocytes	20–40
Monocytes	2–10
Index of regeneration (shift to the left)	0,05–0,1
Amount of thrombocytes	180–320 × 10^9/l (giga per litre)
Blood coagulation time (by Lee-White)	5–7 min
Constant of cardiovascular system	
heart rate: in adults	60–80 / min
in neonatals	135–140 /min
Systolic volume of blood	65–70 ml
Minute volume of blood: at rest	4,5–5 l
at physical work	Up to 30 l
Time of cardiac cycle	0.75–1,0 sec
Arterial pressure: Max (systolic)	110–125 mm Hg
Min (diastolic)	60–85 mm Hg
Constant of respiratory system	
Respiration rate: in adults	12–18 / minute
in neonatal	40–55 / minute
Excursion of thorax: (m)	7–10 cm
(f)	5–8 cm
Interrelation of duration inspiration - expiration	1:1.2
Respiratory volume	0,3–0,9 l
Reserve volume of inspiration	1,5–2,0 l
Reserve volume of expiration	1,0–1,5 l
Vital capacity of lung	3,5–5,0 l
Residual volume	1,0–1,5 l
Functional residual capacity	2,5 l
Capacity of inspiration	2,0 l
Dead space	140–170 ml
Coefficient of lung ventilation	1/7
Minute volume of respiration: at rest	Up to 7 l
at physical activity	Up to 120 l/minute
Alveolar ventilation	4,2–5,6 l/minute
Maximal ventilation lung	120–170 l/minute
pO_2 in alveolar air	110 mm Hg
pCO_2 in alveolar air	40 mm Hg
pO_2 in arterial blood	100 mm Hg
pCO_2 in arterial blood	39 mm Hg
pO_2 in venous blood	40 mm Hg
pCO_2 in venous blood	46 mm Hg
Volume of forced expiration	3 l
Oxygen capacity of blood	19 percent by volume
Ventilation-perfusion coefficient	0,8–0,9
Consumption of oxygen at rest	350 ml/min
Coefficient of use O_2 at rest	40%
Constant of digestive system	
Saliva: amount of excreted saliva daily	1,5 l/day
pH	7,4–8,0
Gastric juice: daily volume	2,0–2,5 l
pH	1,5–1,8
Intestinal juice: pH juice of small intestines	5,05–7,07
Pancreas juice: daily volume	1,5–2,0 l
pH	7,8–8,4

Bile: daily volume	500–1500 ml

Constants of metabolism and energy

Biological value of proteins:	
animal origin	70–95%
vegetable origin	60–65%
Daily need:	
Proteins	70–80 g (of them 30% are animals)
Fats	70–80 g (of them 75–80% are animals)
Carbohydrates	400–450 g
Water content in an organism	
Men	61%;
Women	51%; (compare 53,5%)
Neonatal	75%
Formation of water in an organism at oxidation:	
100 g of carbohydrates	55 ml
100 g of proteins	41 ml
100 fats	107 ml
Daily balance of water	near 2,5 l
Food value:	
1 g of fats	9,3 kcal (39,0 kilojoule)
1 g of carbohydrates	4,1 kcal (17,1 kilojoule)
1 g of proteins	4,1 kcal (17,1 kilojoule)
Respiratory coefficient at oxidation in an organism	
Carbohydrates	1
Fats	0,7
Proteins	0,8
The basic metabolism:	
Men	7117 kilojoule (1700 kcal) a day
Women	6410 kilojoule (1530 kcal) a day

Constants of thermoregulation

temperature	
axilla	36,5–36,9°C
in oral cavity	36,4–37,2°C
rectum	36,8–37,6°C
daily temperature fluctuation	
Max	at 4–6 p.m.
Min	at 3–4 a.m.
hyperthermia	body temperature > 37 °C
hypothermia	body temperature < 35 °C

Constants of excretion

Efficient filtration pressure	20 mm Hg
General filtration surface of glomuluses	1.5–2 m^2
Renal blood flow	of 1200 ml/minutes
Renal plasma flow	650 ml/minutes
Amount of initial urine a day	150–170 l
Amount of final urine a day	1,5 l
Relative density	1,012
Color	from amber -yellow to stramineous
Transparence	transparent

pH	5,0–7,0
Constants of sensory systems	
Frequency of sound fluctuations heard by the person	16–20000 Hz
Closest point of clear vision	10 cm
Acuity of vision (normal)	1,0 and more

CORRECT ANSWERS
PHYSIOLOGY OF BLOOD SYSTEM

№ of question	Correct answer	№ of question	Correct answer	№ of question	Correct answer
1	c	18	d	35	c
2	c	19	b	36	c
3	d	20	c	37	c
4	b	21	c	38	d
5	d	22	d	39	d
6	a	23	a	40	c
7	c	24	c	41	c
8	d	25	c	42	c
9	b	26	b	43	b
10	c	27	c	44	d
11	b	28	a	45	c
12	a	29	c	46	b
13	b	30	b	47	d
14	c	31	d	48	b
15	d	32	c	49	a
16	c	33	c	50	d
17	b	34	b		

PHYSIOLOGY OF CARDIOVASCULAR SYSTEM

№ of question	Correct answer	№ of question	Correct answer	№ of question	Correct answer
51	a	68	c	85	c
52	b	69	d	86	b
53	b	70	c	87	b
54	b	71	b	88	c
55	b	72	c	89	c
56	a	73	d	90	b
57	b	74	b	91	c
58	c	75	d	92	a
59	c	76	c	93	c
60	c	77	b	94	c

61	b	78	a	95	c
62	c	79	d	96	b
63	c	80	b	97	b
64	d	81	b	98	c
65	a	82	c	99	c
66	b	83	d	100	c
67	c	84	b		

PHYSIOLOGY OF RESPIRATORY SYSTEM

№ of question	Correct answer	№ of question	Correct answer	№ of question	Correct answer
101	c	118	b	135	a
102	d	119	c	136	c
103	b	120	d	137	c
104	a	121	b	138	a
105	b	122	a	139	b
106	b	123	d	140	c
107	c	124	c	141	d
108	c	125	c	142	b
109	c	126	d	143	c
110	a	127	a	144	c
111	c	128	c	145	a
112	a	129	c	146	c
113	c	130	a	147	c
114	c	131	b	148	a
115	c	132	c	149	d
116	c	133	b	150	b
117	c	134	c		

PHYSIOLOGY OF DIGESTIVE SYSTEM

№ of question	Correct answer	№ of question	Correct answer	№ of question	Correct answer
151	a	168	a	185	c
152	b	169	d	186	b
153	d	170	b	187	c
154	b	171	a	188	d
155	a	172	c	189	d
156	c	173	a	190	d
157	c	174	b	191	d
158	b	175	b	192	d
159	b	176	d	193	a
160	c	177	b	194	b
161	c	178	c	195	a

162	e	179	b	196	a
163	b	180	c	197	d
164	b	181	c	198	d
165	d	182	c	199	b
166	c	183	c	200	b
167	d	184	d		

METABOLISM. ENERGY METABOLISM. THERMOREGULATION.

№ of question	Correct answer	№ of question	Correct answer	№ of question	Correct answer
201	b	218	d	235	c
202	d	219	c	236	a
203	b	220	b	237	b
204	c	221	c	238	d
205	c	222	c	239	c
206	c	223	d	240	c
207	d	224	b	241	b
208	b	225	a	242	b
209	d	226	d	243	b
210	b	227	b	244	a
211	b	228	b	245	c
212	c	229	d	246	a
213	b	230	a	247	b
214	d	231	c	248	c
215	b	232	c	249	c
216	d	233	b	250	c
217	c	234	b		

PHYSIOLOGY OF EXCRETION

№ of question	Correct answer	№ of question	Correct answer	№ of question	Correct answer
251	b	268	c	285	c
252	d	269	a	286	c
253	d	270	d	287	b
254	c	271	b	288	c
255	d	272	b	289	b
256	a	273	d	290	c
257	b	274	c	291	b
258	d	275	b	292	b
259	d	276	b	293	d
260	c	277	d	294	b
261	a	278	c	295	c
262	a	279	d	296	a

263	d	280	b	297	b
264	b	281	c	298	c
265	d	282	d	299	c
266	b	283	b	300	c
267	b	284	d		

PHYSIOLOGY OF EXCITABLE TISSUES

№ of question	Correct answer	№ of question	Correct answer	№ of question	Correct answer
301	c	318	d	335	c
302	c	319	c	336	b
303	d	320	d	337	b
304	c	321	b	338	c
305	d	322	b	339	b
306	a	323	c	340	a
307	d	324	b		
308	a	325	c		
309	a	326	c		
310	d	327	d		
311	d	328	a		
312	c	329	a		
313	c	330	c		
314	b	331	c		
315	c	332	c		
316	a	333	c		
317	a	334	c		

PHYSIOLOGY OF MUSCLES

№ of question	Correct answer	№ of question	Correct answer	№ of question	Correct answer
341	c	358	b		
342	a	359	c		
343	b	360	c		
344	a	361	c		
345	c	362	c		
346	b	363	c		
347	b	364	a		
348	a	365	a		
349	a	366	a		
350	b	367	b		
351	a	368	b		
352	a	369	b		

353	b	370	b
354	a		
355	d		
356	c		
357	c		

GENERAL PHYSIOLOGY OF CENTRAL NERVOUS SYSTEM

№ of question	Correct answer	№ of question	Correct answer	№ of question	Correct answer
371	c	388	b		
372	c	389	c		
373	c	390	c		
374	a	391	c		
375	b	392	a		
376	c	393	b		
377	d	394	a		
378	b	395	a		
379	c	396	b		
380	a	397	a		
381	a	398	b		
382	c	399	a		
383	a	400	b		
384	d				
385	b				
386	a				
387	c				

PARTICULAR PHYSIOLOGY OF CENTRAL NERVOUS SYSTEM

№ of question	Correct answer	№ of question	Correct answer	№ of question	Correct answer
401	b	418	f		
402	b	419	a		
403	b	420	c		
404	c	421	b		
405	a	422	a		
406	b	423	a		
407	b	424	b		
408	c	425	b		
409	c	426	a		
410	c	427	b		
411	c	428	a		
412	a	429	a		

413	d	430	a
414	b		
415	a		
416	d		
417	b		

PHYSIOLOGY OF ENDOCRINE SYSTEM

№ of question	Correct answer	№ of question	Correct answer	№ of question	Correct answer
431	b	450	b	469	c
432	a	451	b	470	b
433	a	452	b	471	b
434	b	453	b	472	c
435	c	454	c	473	d
436	b	455	c	474	b
437	c	456	c	475	b
438	a	457	b	476	c
439	b	458	a	477	a
440	c	459	b	478	c
441	a	460	a	479	b
442	c	461	b	480	b
443	b	462	a		
444	a	463	b		
445	c	464	d		
446	c	465	d		
447	a	466	a		
448	b	467	a		
449	c	468	b		

PHYSIOLOGY OF SENSORY SYSTEMS

№ of question	Correct answer	№ of question	Correct answer	№ of question	Correct answer
481	b	505	c	529	a
482	c	506	c	530	b
483	b	507	c	531	a
484	a	508	c	532	c
485	b	509	d	533	a
486	a	510	a	534	b
487	d	511	b	535	c
488	a	512	b	536	a
489	c	513	d	537	c
490	c	514	a	538	c
491	b	515	d	539	c
492	a	516	c	540	b
493	d	517	b	541	b
494	c	518	a	542	d
495	c	519	c	543	b
496	c	520	c	544	c

497	b	521	d	545	b
498	b	522	c	546	d
499	a	523	a	547	b
500	b	524	a	548	b
501	b	525	d	549	d
502	b	526	c	550	b
503	c	527	a		
504	b	528	d		

PHYSIOLOGY OF HIGHER NERVOUS ACTIVITY

№ of question	Correct answer	№ of question	Correct answer	№ of question	Correct answer
551	b	568	d	585	c
552	c	569	b	586	a
553	b	570	b	587	d
554	d	571	c	588	b
555	b	572	d	589	c
556	a	573	c	590	d
557	c	574	b	591	a
558	b	575	b	592	c
559	b	576	a	593	c
560	c	577	b	594	b
561	d	578	b	595	c
562	c	579	b	596	c
563	a	580	b	597	b
564	b	581	b	598	c
565	c	582	b	599	b
566	d	583	c	600	a
567	b	584	c		

LITERATURE

Basic

1. Физиология человека: учебник; под ред. В. М. Покровского и Д.Ф. Коротько. В 2 т. — М.: Медицина, 1997.

2. Физиология человека / Под ред. Р. Шмидта и Д. Тевса. — М.: Мир, 1996.

3. Физиология человека / Под ред. Д. И. Косицкого. — М.: Медицина, 1985. — 544 с.

4. Human physiology: series of lectures for overseas students in English medium = Физиология человека: конспективный курс лекций для иностранных студентов, обучающихся на английском языке / А. И. Киеня, Э. М. Заика, В. А. Мельник; под редакцией проф. Э.С. Питкевича; перевод на анг. яз. Р. А. Карпов, В. А. Мельник: В 2 ч. — Гомель: УО «Гомельский государственный медицинский университет». 2006.

5. *Заика, Э. М.* Физиология сердечно-сосудистой системы: Конспективный курс лекций. — Гомель: Гомельский государственный медицинский университет, 2005. — 53 с.

6. *Киеня, А. И.* Физиология жидких сред организма человека: учеб. пособие. — Гомель, 2001. — 70 с.

7. *Киеня, А. И.* Руководство к практическим занятиям по нормальной физиологии / А. И. Киненя, Э. М. Заика; под ред. проф. А. И. Киени. — Гомель, 1999. — 115 с.

8. Руководство к практическим занятиям по физиологии / Под ред. чл.-корр. АМН СССР Д. И. Косицкого и проф. В. А. Полянцева. — М.: Медицина, 1988.

9. Практикум по нормальной физиологии / Под ред. проф. Н.А. Агаджаняна и проф. А. В. Коробкова. — М.: Высшая школа, 1983.

10. Атлас по нормальной физиологии / Под ред. проф. Н. А. Агаджаняна. — М.: Высшая школа, 1986.

11. *Орлов, Р. М.* Нормальная физиолгия: учебник / Р. М. Орлов, А. Д. Ноздрачев. — DЭОТАР-Медиа, 2005. — 696 с.

Optional

1. *Киеня, А. И.* Здоровый человек. Основные показатели: справочник / А. И. Киеня, Ю. И. Бандажевский — Мн.: «Экоперспектива», 1997.

2. *Киеня, А. И.* Международная система единиц в медицине и биологии / А. И. Киеня, Ю. И. Бандажевский — Гомель, 1995.

3. Textbook of medical physiology // C. Guyton, 1986, — 1057 p.

4. Human anatomy and physiology // Alexander P., Spence-Elliott B. Masson.
5. Human physiology. The mechanisms of body function // Arthur J. Vander James H Sherman Dorothy S. Luciano, 1986, — 715 p.
6. Lecture notes on human physiology // John J Bray, Patricia A. Cragg, Anthony D.C. Macknight, Roland G. Mills and Douglass W. Taylor.
7. Human anatomy and physiology // Elaine N. Maried, 1989, — 995 p.
8. Review of medical Physiology, International edition, 2003, — 912 p.

CONTENTS

ISBN 978-985-6779-91-9

Учебное издание

Мельник Светлана Николаевна
Заика Эдуард Михайлович
Штаненко Наталья Ивановна
Мельник Виктор Александрович
Брель Юлия Игоревна
Шевко Наталья Борисовна
Жукова Анжела Аркадьевна

ТЕСТОВЫЕ ЗАДАНИЯ ПО НОРМАЛЬНОЙ ФИЗИОЛОГИИ
(на английском языке)

Учебно-методическое пособие

Под ред. ***Э. С. Питкевича***

Редактор *Т. Ф. Рулинская*
Компьютерная верстка *А. М. Елисеева*

Подписано в печать 12. 12. 2007
Формат 60×84$^{1}/_{16}$. Бумага офсетная 65 г/м^{2}. Гарнитура «Таймс»

Усл. печ. л. 6,51 . Уч.-изд. л. 7,1. Тираж 100 экз. Заказ № 342

Издатель и полиграфическое исполнение
Учреждение образования
«Гомельский государственный медицинский университет»
246000, г. Гомель, ул. Ланге, 5
ЛИ № 02330/0133072 от 30. 04. 2004