


Ministry of Education and Science of the Russian Federation Ulyanovsk State University	Form	
F- Questions for the exam		

Questions for the exam

1. Subject of physiology and classification of physiological disciplines.
2. Relation of physiology with other sciences.
3. Value of a normal physiology course for medicine.
4. Notion of excitability.
5. Excitability indicators.
6. Law of the power relations.
7. Law "everything or nothing".
8. Membrane potential, its origin and properties
9. Action potential, its origin and properties
10. Local respond and its characteristic
11. Curve of excitability and origin of its phases
12. Effect of a direct current on tissue
13. Concept about a motor and neuromotor unit.
14. Physiological properties of muscles.
15. Irritation of muscles and ways of registration.
16. Single muscular contraction.
17. Change muscle fiber excitability at its reduction.
18. Summation and tetanus. Optimum and pessimum of muscular contraction.
19. Modern theory of muscular contraction and relaxation.
20. Force and muscle work.
21. Exhaustion of the isolated muscle and exhaustion in the whole organism.
22. Adaptation and trophic influence of sympathetic nervous system on skeletal muscles.
23. Heat generation at excitement and contraction of muscles.
24. Physiological features of smooth muscles.
25. Differences of the smooth muscle from the skeletal muscle.
26. Classification of nervous fibers.
27. Distribution of excitement on myelin and non-myelin nervous fibers.
28. Laws of excitement conduction on nervous fibers.
29. Synapse. Structure, classification. Excitement transfer mechanism.
30. Concept of the central nervous system. Definition of a reflex.
31. Structure of a reflex arch.
32. The neuron is a structurally functional unit of CNS`.
33. Features of excitement emergence in neuron.
34. Mechanisms of excitement emergence in receptors.
35. Definition and types of inhibition in CNS`.
36. Postsynaptic inhibition.
37. Presynaptic inhibition.
38. Sechenov Central inhibition.
39. Simple inhibition chains.
40. Spinal cord. Conduction and reflex functions.
41. Functions of ventral and dorsal roots of a spinal cord.

42. Segmental and intersegmental principle of a spinal cord.
43. Spinal shock.
44. Medulla. Bulbar animal.
45. Conduction function of a medulla oblongata.
46. Reflex function of a medulla oblongata.
47. Tonic reflexes of the brainstem.
48. Reticular formation of the brainstem.
49. Midbrain. Conduction function of midbrain.
50. Reflex activity of midbrain.
51. Cerebellum and its function.
52. Hypothalamus. Hypothalamus participation in the regulation of autonomic functions.
53. Thalamus. Functional characteristics of major nuclear groups.
54. Comparative characteristics of the sympathetic and parasympathetic divisions of the autonomic nervous system. The synergy and antagonism of their relative influence.
55. Definition of the analyzer according to I.P.Pavlov. Functions of the analyzer.
56. Visual analyzer
 - a) Receptor apparatus. Photochemical processes in a retina
 - b) Conduction part of the visual analyzer
 - c) Cortical representation of the visual analyzer
 - d) Accommodation. Visual field. Visual acuity
57. Acoustic analyzer. Structure. Functions.
58. Vestibular analyzer. Structure. Functions.
59. Somatosensory analyzer
60. Taste analyzer
61. Olfactory analyzer
62. Concept of reflex. Classification of reflexes.
63. Rules of development of conditioned reflexes.
64. The scheme and mechanisms of short circuit of temporary communications at development of conditioned reflexes
65. Types of higher nervous activity. The doctrine about the first and second alarm systems.
66. Inhibition in HNA.
67. Concept of dominant (A.A. Ukhtomsky).
68. Memory. Types and mechanisms of memory.
69. Emotions. Emotional tension.
70. Sleep. Sleep phases.
71. Dynamic stereotype.
72. Excitability of a cardiac muscle
73. Contractility of a cardiac muscle
74. Conductivity of a cardiac muscle
75. Automaticity
76. Self-regulation of heart work
77. Nervous regulation of heart work
78. Heart reflexes.
79. Humoral influences on heart work
80. The cardiac cycle
81. Tones of heart. Phonocardiography.
82. Electrocardiography.
83. Physical characteristics of the blood circulatory system:

- 1) Functional parts of the circulation.
- 2) The laws of hemodynamics.
84. Blood pressure.
 - 1) Pressure in the various portions of the circulation.
 - 2) Clinical methods for measuring systolic and diastolic pressure.
 - 3) Regulation of arterial pressure.
85. Arterial pressure pulsation.
86. Venous pressure pulsation.
87. The microcirculation.
 - 1) Structure of the microcirculation and capillary system.
 - 2) Average function of the capillary system.
 - 3) Fluid filtration across capillaries.
88. Control of blood flow by the tissues.
89. Breath definition. Breath stages.
90. Mechanism of breath and exhalation.
91. Pressure in a pleural cavity. Pneumothorax.
92. Pulmonary volumes. Spirometry, spirography, pneumotachography.
93. Composition of the inhaled, exhaled and alveolar air.
94. Gas exchange in lungs.
95. Blood transport of gases.
96. Gas exchange in tissue.
97. Respiratory center (Rhythm generator). Automaticity of the respiratory center.
98. Protective respiratory reflexes.
99. Physiology of airways.
100. Digestion as the main component of functional system on maintenance of level of nutritious in an organism.
101. Digestion types.
102. Research methods of digestive tract functions.
 - a) In experiment
 - a) In clinic
103. Digestive tract innervation.
104. Digestion in a mouth. Structure and properties of saliva.
105. Swallowing.
106. Digestion in a stomach. Composition of gastric juice.
107. Phases of gastric secretion.
108. Structure and properties of pancreatic juice. Regulation of pancreatic secretion.
109. Liver role in digestion.
110. Digestion in a nestis and ileum.
111. Secretion of intestinal juice, its structure, properties, secretion regulation.
112. Digestion in a colon.
113. Motility of a stomach. Evacuation of gastric contents in intestines.
114. Motility of a small and thick intestine.
115. Absorption in various departments of a digestive tract.
116. Eliminative organs.
117. Nephron as a structural function unit of a kidney.
118. Forming and composition of primary urine.
119. Tubular reabsorption as the 2nd stage of formation of final urine.
120. Tubular secretion.
121. Composition of final urine.
122. Regulation of activity of kidneys.

- a) Humoral regulation;
 - b) Nervous control;
 - c) Influence of arterial pressure up on work of kidneys.
123. Act of uresis.
 124. Definition, classification of hormones.
 125. Interrelation and interaction of endocrine glands.
 126. Hormones of an adenohypophysis.
 127. Physiology of a thyroid gland.
 128. Parathyroid glands.
 129. Pancreas physiology.
 130. Adrenocortical hormones.
 131. Adrenal medulla hormones.
 132. Reproductive hormones.
 133. Definition of metabolism. Processes of assimilation and dissimilation.
 134. Plastic and energetic role of nutrients.
 135. Nitrogen equilibrium.
 136. Regulation of metabolism.
 137. Energy balance of an organism.
 138. Basic metabolism. Working metabolism.
 139. Hess's law.
 140. Laws of diets.
 141. Heat production.
 142. Thermal control.
 143. Composition of blood.
 144. Blood functions.
 145. Physiological constants of blood.
 146. Blood plasma. Structure, osmotic and oncotic pressure.
 147. Erythrocyte. Structure and functions.
 148. Regulation of erythropoiesis.
 149. Hemoglobin and its combinations.
 150. Erythrocyte sedimentation rate (ESR). Mechanism of ESR.
 151. Leukocytes, quantity, leukogram.
 152. Regulation of granulocytopoiesis and monocytopenoiesis.
 153. Lymphocytes. Regulation of lymphocytopoiesis.
 154. Thrombocytes, quantity, functions.
 155. Types and mechanism of hemolysis.
 156. Blood fibrillation process. Blood fibrillation factors.
 157. Blood fibrillation phases.
 158. The anticoagulation system
 159. The doctrine about blood groups. Rh factor.

Head of the Department
of Physiology and Pathophysiology, professor

T.P. Gening

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