**EXAM QUESTIONS**

**ANATOMY**

**31.05.01 - GENERAL MEDICINE**

1. Subject and content of anatomy. Modern principle.Methods of anatomical research.Axes and planes in anatomy.Lines conventionally drawn on the surface of the body, their value for determining the projection of organs on the skin.

2. The history of development of anatomy. Methods proposed for the study of topography of organs, their significance for anatomy and practical medicine. Russian anatomy in the XX-th century.

3. Bone as an organ. Classification of bones, types of ossification. The growth of bones.Osteon. Age features.

4. Vertebrae: structure in various parts of the spine, variants and anomalies; connections between vertebrae. Atlanto-occipital joint, movements in this joint.

5. The vertebral column as a whole: anatomy, the formation of its bends. The muscles that produce the movement of the spinal column, their blood supply, innervation.

6. Ribs and sternum: structure, variants and anomalies of development. Joints of ribs with vertebrae and sternum.The thorax as a whole, its individual and typological features.The movements of the ribs, the muscles that produce the movements, their blood supply and innervation.

7. Development of the axial skeleton in Philo-and ontogenesis. Variants and anomalies.

8. Bones of the cerebral part of the skull (frontal, occipital, latticed): structure, holes and their purpose. Variants and anomalies.

9. Sphenoid bone, its parts, holes and their purpose.

10. Temporal bone: its parts, holes, channels and their purpose.

11. Bones of the facial skull. The hyoid bone, the muscles associated with it, their blood supply and innervation. The places typical of the fractures.

12. Eye socket, the structure of its walls, holes and their purpose.

13. The outer surface of the base of the skull. Holes and their purpose. Places of typical fractures of the base of the skull.

14. The inner surface of the base of the skull, holes and their purpose. The buttresses of the skull.

15. Temporal, sub-temporal and pterygoid-palatine fossa, their walls and messages.

16. Craniometric points of the facial skull. Latitudinal-longitudinal and high-altitude indicators of the skull.

17. Development of the skull in Philo-and ontogenesis. Types of ossification.Anomaly of development.Features of the structure of the skull of a newborn. Age-related changes in the skull.

18. Structure of the upper limb skeleton. Bones of the shoulder girdle and shoulder, their connections.Development, variants and abnormalities of the upper limb.Features of the upper limb as a tool.

19. Muscles, topography and fascia of the shoulder girdle and shoulder, their blood supply and innervation.

20. Structure of the skeleton of the lower limb. The bones of the leg and foot and their connection.Features of anatomy (skeleton, joints and muscles) of the lower limb as an organ of support and movement.Development, variants and abnormalities of the lower limb.

21. The bones of the pelvis and their connections. Pelvis as a whole.Age and sex characteristics of the pelvis.The size of the female pelvis.

22. Muscles and fascia of the lower leg and foot, their functions, blood supply, innervation. Synovial vaginas of the foot.

23. The development of the limb bones in phylo - and ontogenesis. Anomaly of development.

24. Classification of joints by the shape of the articular surfaces, the number of axes and function. Structure of the joint.Anatomical and biomechanical classification of bone connections.The types of continuous connections of bones.

25. Connecting the bones of the skull, sutures, synchondrosis. Temporomandibular joint: structure, shape, muscles acting on this joint, their blood supply and innervation.

26. Semi-joints, structure, morphological and functional characteristics

27. Shoulder joint: structure, shape, movement, muscles acting on the joint, blood supply and innervation of the joint and muscles.

28. Elbow joint, features of its structure. Muscles acting on the elbow joint, their innervation and blood supply. X-ray image of the joint.

29. Wrist joint and hand joints: structure, shape, movements, muscles acting on the joints of the hand, their blood supply and innervation. X-ray image of the bones and joints of the hand.

30. Knee joint: structure, shape, movement; muscles acting on the knee joint. Blood supply, innervation, regional lymph nodes of the joint and muscles. X-ray image of the joint.

31. Hip joint: features of structure, shape, movement; muscles that produce these movements. Blood supply, innervation. X-ray image of the hip joint.

32. Ankle joint: structure, shape, muscles that produce movement. Blood supply, regional lymph nodes, innervation of the joint and muscles. X-ray image of the joint.

33. Auxiliary devices of muscles: fascia, synovial vaginas, mucous bags, sesamoid bones, their position and purpose. Muscles are synergists and antagonists.

34. General anatomy of muscles. Classification of muscles (by shape, structure, function, location).The structure of the muscle as an organ.Development of skeletal muscles.

35. Facial muscles. Anatomy, topography, function, blood supply, and innervation.

36. Chewing muscles: topography, functions, blood supply, innervation. Fascia of the masticatory muscles.

37. Neck muscles: topography, function, blood supply and innervation. Fascia of the neck.Triangles of the neck.

38. Chest muscles and fascia, their function, blood supply and innervation. The diaphragm, its parts.

39. Muscles and fascia of the back, their topography, structure, functions, blood supply and innervation.

40. Anatomy of abdominal muscles, their topography, functions, blood supply, innervation. The vagina of the rectus abdominis muscle.The white line of the abdomen.

41. The muscles and fascia of the shoulder: their anatomy, topography, function, blood supply and innervation. The canal of the radial nerve.

42. Muscles, topography, fascia of the forearm and hand. Functions, blood supply and innervation.Bone-fibrous channels and synovial vaginas of the hand.

43. Anatomy of the gluteal region: muscles, topography, their blood supply, innervation, functions.

44. Muscles, topography and fascia of the thigh, their blood supply, innervation. Muscle and vascular lacunae.Driving channel.

45. Muscles and fascia of the lower leg and foot, their functions, blood supply, innervation. Popliteal space.Synovial vaginas of the foot.

46. Muscles and fascia of the male and female perineum. Their blood supply and innervation.

47. Places of possible occurrence of hernias. Inguinal canal, its walls.Weak points of the anterior abdominal wall. Femoral canal, its walls, rings (deep, subcutaneous).

48. Development of the digestive system. Interaction of the stomach and intestines at different stages of ontogenesis (dorsal and ventral mesentery stomachs and intestines).

49. Oral cavity: division, lips, cheeks, palate, arches, pharynx, tonsils (structure, blood supply, innervation, regional lymph nodes). Anomalies in the development of the oral cavity.

50. Large salivary glands: topography, structure, excretory ducts, blood supply, innervation.

51. Tongue, tongue muscles, papillae: structure, function, development, innervation (somatic and vegetative), blood supply, regional lymph nodes.

52. Teeth are milk and permanent. Dentition, its formula; blood supply, innervation of teeth.Variants and anomalies of teeth and dentition. Bite: physiological, pathological.

53. Pharynx: topography, division into departments, wall structure, innervation, blood supply, regional lymph nodes. Lymphoepithelial pharyngeal ring of Pirogov-Waldeyer.

54. Esophagus: topography, wall structure, innervation, blood supply, regional lymph nodes. Methods of lifetime research.

55. Stomach: anatomy, topography, blood supply and innervation, x-ray image. Regional lymph nodes.Methods of lifetime research.

56. The small intestine: its divisions, their topography, relation to the peritoneum, wall structure, innervation, blood supply, regional lymph nodes, variants and anomalies. Methods of lifetime research.

57. Duodenum: its parts, topography, structure, relation to the peritoneum, blood supply, regional lymph nodes, innervation. Methods of lifetime research.

58. Mesenteric part of the small intestine (skinny and iliac), wall structure, blood supply, innervation, regional lymph nodes.

59. Colon: departments, their topography, relation to the peritoneum, blood supply, regional lymph nodes, innervation, methods of in vivo research.

60. The caecum: structure, relation to the peritoneum, topography of the vermiform process. Blood supply, innervation of the caecum and vermiform process.

61. Rectum: topography, relation to the peritoneum, wall structure, blood supply, regional lymph nodes, innervation.

62. Liver: topography, structure. Segmental structure.Ligaments of the liver.Gallbladder. Excretory ducts of the liver and gall bladder. Blood supply, regional lymph nodes, innervation of the liver and gall bladder.

63. Spleen: topography, structure, blood supply, innervation.

64. Pancreas: topography, structure, excretory ducts, intersecretory part; blood supply, innervation, regional lymph nodes.

65. The peritoneum (the leaves move, against the authorities, lesser omentum, omental pouch, the greater omentum, pockets, grooves).

66. External nose. Nasal cavity (respiratory and olfactory areas).Blood supply and innervation of the nasal mucosa.

67. Larynx: cartilage, their connection. The muscles of the larynx, and their functions. Innervation and blood supply to the larynx.

68. The trachea and bronchi. Their topography, structure, innervation, blood supply, regional lymph nodes.Methods of lifetime research.

69. Lungs: topography, structure, development, structural and functional unit of the lungs, x-ray image, blood supply, innervation, regional lymph nodes. Segmental structure of the lungs.Methods of lifetime research.

70. Pleura: structure, pleural cavity, pleural sinuses. Mediastinum: departments, their topography, mediastinal organs.

71. Kidneys, their development, anatomy, topography, kidney shells, innervation, blood supply, regional lymph nodes, methods of in vivo research, variants and anomalies. Abnormalities of kidney development.

72. Ureters and bladder: their topography, structure, blood supply, innervation, regional lymph nodes. The urethra, its sexual characteristics.

73. Development of the urinary system. Abnormalities of the ureters, bladder, and urethra.

74. General overview of female genitals. Ovaries, their topography, structure, blood supply, innervation. Age features.

75. Uterus and fallopian tubes: topography, ligaments, relation to the peritoneum, blood supply, innervation. Regional lymph nodes.

76. General overview of the male genitals. Testicle, epididymis, structure, blood supply, innervation.The shell of the egg.Variants and abnormalities of the testicle.

77. Prostate gland, seminal vesicles. Bulbourethral (Cooper's) glands, their topography, structure, blood supply, regional lymph nodes, innervation, their relationship to the urethra.

78. Development of the sexual system. Differentiation by female and male type.Anomaly of development.The concept of hermaphroditism.

79. Heart, topography, structure of heart chambers, projection of borders and heart valves on the anterior chest wall, development.

80. Development of the cardiovascular system. Main abnormalities of heart development.Methods of lifetime research.

81. Heart: topography, structure, arteries and veins of the heart. Features of the structure of the myocardium of the Atria and ventricles of the heart.Valvular apparatus of the heart.

82. The conducting system of the heart. Pericardium, its topography.Innervation of the heart.Extra-cardiac and intra-cardiac nerve plexuses.

83. Vessels of the small (pulmonary) circulatory circle (General characteristic). Patterns of distribution of arteries and veins in the lungs.

84. Vessels of the great circle of blood circulation. The aorta, its divisions, branches of the ascending part, the arch of the aorta and its thoracic Department (parietal and visceral). The abdominal aorta, its visceral (paired and unpaired) and parietal branches. Features of their branching and anastomosis.

85. Arteries of the brain. Large arterial circle of the brain (Willis). Sources of blood supply to the brain.

86. General and external carotid artery: topography, branches and areas supplied by them. Anastomoses of the external and internal carotid arteries.

87. Internal carotid artery: topography, branches. Arterial circle of the brain.

88. Axillary and brachial arteries: topography, branches, areas of their blood supply. Blood supply to the shoulder joint.

89. Arteries of the shoulder and forearm: topography, branches, areas, blood supply to them. Blood supply to the elbow joint.

90. Subclavian artery: topography, branches and areas supplied by them. Blood supply to the spinal cord.

91. Shield-neck trunk, topography, branches, areas of blood supply, anastomoses.

92. Costal-cervical trunk, topography, branches, areas of blood supply.

93. Arteries of the hand. Arterial Palmar arches and their branches.

94. Femoral and popliteal arteries, their topography and branches. Blood supply to the knee joint.

95. Arteries of the lower leg and foot; topography, branches, areas, blood supply to them. Blood supply to the ankle joint. Arterial arcs on the foot.

96. General and external iliac arteries, their branches and areas of blood supply.

97. Internal iliac artery: branches and areas of blood supply.

98. Veins of the brain. Venous sinuses of the Dura mater. Venous graduates (emissaries) and diploic veins. Anastomoses of intra-and extra-cranial veins.

99. Veins of the head and neck. Anastomoses of intra-and extra-cranial veins.

100. Veins of the eye socket, their tributaries, anastomoses.

101. Internal jugular vein, its topography, tributaries (intracranial and extracranial). Connections between intracranial and extra-cranial veins (diploic and emissary veins).

102. External jugular vein, its formation, topography, tributaries.

103. Brachiocephalic veins, their formation. Outflow of venous blood from the head, neck, upper limb.

104. Subclavian vein, its formation, topography, tributaries.

105. Portal vein: tributaries, their topography; branching portal vein in the liver. Anastomoses of the portal vein and its tributaries.

106. Venous plexus. Intersystem and intersystem anastomoses of veins (cava-caval, cava-cava-portal, portocaval).

107. Upper hollow vein, sources of its formation and topography. Unpaired and semi-detached veins.Anastomoses of the superior Vena cava.

108. Lower hollow vein, sources of its formation and topography. Tributaries of the inferior Vena cava.The main venous collectors and pelvic plexus.Veins of the lower extremity.

109. Superficial and deep veins of the upper extremity, their topography, anastomoses.

110. Superficial and deep veins of the lower extremity and their topography.

111. Peculiarities of blood supply of the fetus and change hematological system after birth.

112. Principles of the structure of the lymphatic system (capillaries, vessels, trunks, ducts, nodes). Pathways of lymph outflow to the venous bed. Factors that cause lymph flow.

113. The lymph node as an organ (structure, function). Classification of lymph nodes.

114. Thoracic, right lymphatic ducts, their formation, topography, place of confluence with the venous channel.

115. Lymphatic vessels and regional lymph nodes of the head and neck.

116. Lymphatic vessels and nodes of the chest cavity. The lymphatic channel of the lungs.

117. Lymphatic vessels and regional lymph nodes of the abdominal organs.

118. Superficial and deep formations of the upper limb (veins, lymphatic vessels and nodes).

119. Superficial and deep formations of the lower extremity (veins, lymphatic vessels and nodes).

120. Central organs of the immune system: bone marrow, thymus. Their topography, development, age features.

121. Peripheral organs of the immune system. Their topography, development, age features.

122. The main stages of development of the Central nervous system. Brain bubbles and their derivatives.The concept of a neuron.Simple and complex reflex arcs.Nerve fibers, bundles, roots.

123. Spinal cord: position in the spinal canal, internal structure. Localization of conducting pathways in white matter.Membranes of the spinal cord. Blood supply to the spinal cord.

124. The medulla oblongata, its macro-and microstructure. Topography of cranial nerve nuclei and pathways in the medulla oblongata.

125. Rhomboid fossa: its relief, the projection of cranial nerves on the surface of the rhomboid fossa.

126. Anatomy and topography of the IV ventricle of the brain. Ways of outflow of cerebrospinal fluid.

127. The cerebellum, its structure, the nucleus of the cerebellum, the legs of the cerebellum.

128. Anatomy and topography of the bridge. Its internal structure, the position of the cores and conducting paths in the bridge.

129. Anatomy and topography of the midbrain: its parts, their internal structure, connections with other parts of the brain. The position of the nuclei and pathways in the midbrain.Cavity of the midbrain.

130. Intermediate brain: parts, internal structure, connections with other parts of the brain. Third ventricle.

131. Furrows and convolutions of the dorso-lateral, medial and basal surfaces of the hemispheres of the large brain. Location of cortical centers in the cortex.

132. Furrows and convolutions of the upper-lateral, medial and basal surfaces of the cerebral hemispheres. Location of cortical centers in the cortex.

133. The structure of the cerebral cortex and the associative system of its white matter fibers. The doctrine of dynamic localization of functions in the cerebral cortex in the light of the teachings of I. p. Pavlov. Analyzers I and II signal systems.

134. Gray and white matter on sections of the brain hemispheres (basal nuclei, location and functional value of nerve bundles in the inner capsule).

135. Anatomy and topography of the olfactory brain; its Central and peripheral divisions.

136. Membranes of the brain and spinal cord. Subdural and subarachnoid spaces of the brain.Production and outflow of spinal fluid.

137. The lateral ventricles of the brain, their walls and messages. Vascular-epithelial plexus of the ventricles of the brain. Ways of outflow of spinal fluid.

138. Commissural and projection fibers of the cerebral hemispheres (corpus callosum, arch, adhesions, inner capsule).

139. Reticular formation (nuclei, connections, function).

140. The limbic system: the nucleus, position in the brain, communications, functional role.

141. Pathway exteroceptive types of sensitivity. The position of the pathways of pain and temperature sensitivity in different parts of the spinal cord and brain.

142. The conducting tracts of proprioceptive sensitivity of the cortical direction. Their position in various parts of the spinal cord and brain.

143. Motor pathways (pyramidal and extrapyramidal).

144. Conducting pathways of proprioceptive sensitivity of the cerebellar direction, their position in various parts of the spinal cord and brain.

145. Medial loop, fiber composition, position in various parts of the brain.

146. Olfactory and optic nerves. Conducting pathway of visual and olfactory impulses.

147. 3, 4, 6 pairs of cranial nerves, areas of their innervation. Pathways of the pupillary reflex.

148. The trigeminal nerve, its nuclei, branches, their topography and areas of innervation.

149. Facial nerve, its nuclei, topography, branches and areas of innervation.

150. The vagus nerve, its nuclei, topography, branches, areas of innervation.

151. Vestibular cochlear nerve, its anatomy, topography, areas of innervation. Conducting pathway of auditory and vestibular impulses.

152. 9 pair of cranial nerves: nuclei, topography, branches, areas of innervation

153. 11, 12 pairs of cranial nerves: nuclei, topography, branches, areas of innervation.

154. Vegetative part of the nervous system, its classification, characteristics of departments.

155. Parasympathetic division of the autonomic nervous system: mesencephalic part (nodes, distribution of branches) and bulbar part.

156. The sympathetic trunk: its topography, nodes, and branches.

157. Cervical plexus: topography, branches, area of innervation.

158. Brachial plexus: branches of the supraclavicular part, areas of innervation, branches of the subclavian part, areas of innervation. Innervation of the upper limb skin.

159. The sympathetic part of the autonomic (vegetative) nervous system, the Central and peripheral parts of it. The ventral plexus, its lower nodes.

160. Sympathetic plexus of the abdominal cavity and pelvis (ventral, mesenteric, upper and lower submandibular). Sources of formation, nodes, branches.

161. Sciatic nerve, its branches, areas of innervation. Innervation of the skin of the lower extremities.

162. Lumbar plexus, its topography, nerves, areas of innervation.

163. Sacral plexus, its nerves and innervation areas.

164. Organ of vision: the General plan of the structure; the eyeball and its auxiliary apparatus. Refractive media of the eye: cornea, eye chamber fluid, lens, vitreous body. The retina of the eye.The pathway of the visual analyzer.

165. Organ of hearing and balance. General plan of the structure and functional features.Conducting pathways of auditory and vestibular impulses.

166. The outer ear, its parts, structure. Anatomy of the middle ear (tympanic cavity, auditory bones, auditory tube, mastoid cells). Blood supply, innervation of the outer and middle ear.

167. Inner ear: hearing organ (cochlea, its bony and membranous labyrinths, spiral organ), their anatomical characteristics. Conductive path of the auditory analyzer.

168. Organ of taste: structure, blood supply, innervation. Conducting path of the taste analyzer.

169. Branchiogenic glands of internal secretion: thyroid, parathyroid. Their structure, topography, functions, blood supply, innervation.

170. Neurogenic glands of internal secretion: pituitary, pineal gland, topography, structure, function.