## HISTOLOGY EXAM QUESTIONS

1. Techniques used in morphology. Microscopy, its types.

2. Cell membrane: structure, functional role of the chemical constituents.

3. Cell membranes, their functions. Transport of substances: active, passive, endoand exocytosis.

4. The membrane derivatives (cell surface modifications).

5. Nucleus, its general structure and functions. Organization of chromatin. Transcription.

6. Endoplasmic reticulum and Golgi. Their general structure, functions and interaction.

7. Mitochondria, its general structure and functions.

8. Lysosomes (acid vesicle system), peroxisomes. Their types and functions.

9. Cytoskeleton of the cell. Types and functions of the cytoskeletal proteins. Centriole. Cilia. Basal body.

10. Ribosomes and protein synthesis. Cell inclusions.

11. The cell cycle. Mitosis and its phases.

12. Cell populations. Their characteristics.

13. Cell differentiation, ageing and cellular death. The factors having the influence on the differentiation. Apoptosis.

14. Tissues: concept and classification.

15. Epithelium: embryonic development, morphological features, functions, classification and derivation.

16. Epithelial cell polarity and cell-surface specializations

17. Epithelium: structure of the basement membrane and intercellular junctions.

18. Covering epithelium. Ensuring protection (barrier function). Synthesis of keratins.

19. Glandular epithelium. Types of classifications. Secretory cycle. Modes of secretion.

20. Epithelium: belonging to population. Peculiarity of cell cycle.

21. Connective tissues: general structures, functions and classification.

22. Blood. Plasma, its composition and formed elements. Hematocrit. Blood index. Percentage of white blood cells (leukocyte percentage).

23. Blood. Characteristics of red and white blood cells (structure and functions).

24. Loose connective tissue. Localization in the organism. Cells, their features.

25. Loose connective tissue. Extracellular matrix: chemical composition and functions. Synthesis of collagen fiber.

26. Types of specialized connective tissue. Their location in the organism, general structure and functions.

27. Dense connective tissues. Its types, localization, structure and functions. Interaction between loose and dense connective tissue.

28. Dense regular connective tissue. General structure of the tendon, longitudinal and cross section.

29. Cartilage. Types and localization. Chemical composition of the extracellular matrix. Cartilaginous cells. Perichondrium and nutrition of cartilage. Growth of

cartilage.

30. Bone tissue. Its types. Bone cells, their structural features and functions.

31. Bone tissues. Bone matrix: chemical composition and structure.

32. Bone as organ. General structure of bone. Lamellae arrangement and haversian system (osteons). Significance of the periosteum.

33. Bone formation: endochondral and intramembranous.

34. Muscle tissues. Their embryonic development, classification, functions and localization.

35. Skeletal muscle tissue. The general structure of muscle fiber. Structural and molecular basis of contraction. Motor and sensory innervation.

36. Cardiac muscle. Embryonic development, types of the cardiac muscle cells, their general structure and functions. Contractile mechanism.

37. Smooth muscle. Embryonic development. Structural and molecular basis of contraction.

38. Nervous tissue: embryonic development, composition, classification, functions. Reflex arch.

39. Neuroglia. Classification, structural features and functions.

40. Ultra- and microscopic features of the perikarion and processes of the neurons

41. Types of the nervous processes, their features and functions. Neuroglial relation. Formation of myelin.

42. Synapses. Classification. Ultramicroscopic feature of the chemical synapses. Neurotransmitters.

43. Nervous processes. Nervous terminal. Axonal transport system. Peripheral nerve: connective tissue components of a nerve.

44. Micromorphological organization of the spinal cord. Meninges. Nuclei of gray matter. Segment of spinal cord. Morphology of spinal (dorsal root) ganglion. Composition of spinal nerve.

45. Cerebellum, its divisions and their functional role. Histology of the cerebellar cortex. Cerebellar afferent and efferent connections.

46. Telencephalon. Layers of the brain cortex. Concepts of cortical architecture - neuronal columns and modules. Brain cortex connections: associative, projective and commissural fibers.

47. Autonomic nervous system: general organization and functional role. Autonomic reflex arch. Organization of the autonomic ganglia.

48. Visual apparatus. Sclera. Cornea. Microscopic structure. Corneal reflex.

49. Visual apparatus. Choroid. Ciliary body. Chambers of the eye. Iris. Microscopic structure and functional role. Pupillary light reflex.

50. Visual apparatus. Retina. Microstructure of the retina: layers and cells. Visual pathway.

51. Ocular refractive media. Aqueous humor balance. Microscopic structure of the vitreous body, lens. Accommodation reflex.

52. Internal ear. Structure of the osseous and membranous labyrinths. Perilymph and endolymph circulation.

53. Cochlea. Spiral organ of Corti. Types of cells, their functional role.

54. Mechanism of auditory reception.

55. Microstructure of utricle, saccule and semicircular ducts. Functions of the vestibular tract.

56. Cardiovascular system. Embryonic development. General considerations, classification and functional role of the vessels. Structure of blood vessels. Vascularization and innervation of blood vessels. Types of the capillaries.

57. Heart, its embryonic development, micromorphology. Coordination of cardiac activity: conduction system, its structure and functional role.

58. Bone marrow. Forms of bone marrow. Structure and vascular supply of bone marrow. Embryonic and postembryonic hematopoiesis.

59. Lymphopoiesis.

60. Erythropoiesis and thrombocytopoiesis.

61. Granulocytopoiesis and monocytopoiesis.

62. Thymus. Embryonic development. Micromorphology of the thymus. Thymic hormones and other secreted factors.

63. Lymph nodes. Micromorphology of the lymph nodes. B- and T-zones in lymph nodes. Functions of the lymph nodes.

64. Spleen. Embryonic development. Function of the spleen. Micromorphology of the spleen. The features of splenic microcirculation.

65. General features of the digestive system. Main organs, their functions. Embryonic development. General plan of the alimentary canal.

66. Oral cavity. Microstructure of the wall of oral cavity. Teeth. Embryonic development of a tooth.

67. Tongue. Micromorphology of the tongue: papillae, layers. Gustatory apparatus (receptor part).

68. Salivary glands. Micromorphology of the salivary glands.

69. Pharynx. Its parts, Waldeyer's ring. Morphology of tonsils.

70. Oesophagus. Micromorphology of the oesophagus.

71. Stomach. Micromorphology of the stomach.

72. Small intestine. Micromorphology of the small intestine.

73. Large intestine. Micromorphology of the large intestine, vermiform appendix.

74. Pancreas. Micromorphology of the pancreas.

75. Liver. Micromorphology of the liver.

76. General organization of the respiratory system. Structural features of the epithelium of the different parts of the respiratory system.

77. Divisions of the respiratory system. Upper respiratory tract: nasal cavity, paranasal sinuses, nasopharynx, oropharynx. Their microstructures. Olfactory apparatus (receptor part).

78. Trachea, bronchi. Their microstructures.

79. Lung. Bronchopulmonary microstructure. Air passage and alveolar epithelium, cell types. Structure of air-blood barrier.

80. Endocrine system: general organization, classification and functions. Principles of the vascularization. Morphology of the hormone-producing cell.

81. Hypophysis (pituitary gland). Embryonic development. Micromorphology of the pituitary gland, its connection with hypothalamus.

82. Thyroid gland, parathyroid gland. Micromorphology. Control of hormone

secretion.

83. Suprarenal glands. Embryonic development. Micromorphology.

84. Pineal gland. Micromorphology.

85. Diffuse neuroendocrine system: gut-associated endocrine cells, respiratory-associated endocrine cells. Paraganglia.

86. Kidney. Embryonic development. Micromorphology, functions. Nephron as unit of the kidney parenchyma. Juxtaglomerular apparatus.

87. Urinary tracts. Micromorphology.

88. Male reproductive system. Embryonic development. Microstructure of the testes, epididymis Spermatogenic cycle.

89. Vas deferens, ejaculatory duct. Seminal vesicles, prostate. Structure and functions. Endocrine control.

90. Female reproductive system. Embryonic development. Uterus and fallopian tubes. Micromorphology. Menstrual cycle and endocrine control.

91. Ovary. Micromorphology. Gamete production, maturation and ovulation. Formation of corpus luteum.

92. Fertilization and implantation.

93. Development of the fetus. Placenta. The relationship between the fetal and maternal parts.

94. Skin and its derivatives (breast). Structure, functions.