GENERAL MEDICINE

Histology and embryology – questions

I. Cytology and tissues

1. **General structure of the cell, its size and shape. The structure of the cell membrane.**
2. **The ultrastructural and molecular structure of cell membrane.**
3. **Biological membranes, endocytosis and exocytosis.**
4. **Nucleus, nuclear envelope, chromatin, function of the nucleus.**
5. **Nucleolus - LM and EM structure.**
6. **Cytoplasm – hyaloplasm, paraplasm.**
7. **Endoplasmic reticulum - rough (granular) and smooth. Ribosomes.**
8. **Golgi complex - LM and EM structure, function.**
9. **Mitochondria - LM and EM structure and function.**
10. **Lysosomes and peroxisomes.**
11. **Centriol and microtubules.**
12. **Cytoskeleton - microtubules, microfilaments and intermediate filaments.**
13. **EM structure of cells producing proteins and cells transporting ions.**
14. **EM structure of cells producing mucus and steroids.**
15. **Covering epithelial tissue - classification, structure, regeneration.**
16. **Specialization of apical and basal surface of epithelial cells.**
17. **Specialization of lateral surface of epithelial cells. Structure of intercellular junctions.**
18. **Basement membrane, ultrastructure and function.**
19. **Glandular epithelial tissue, classification, structure and function.**

20. Exocrine glands – structure, types.

21. Endocrine glands – structure, types

22. Fixed connective tissue cells – types, structure and function.

23. Fibroblasts, fibrocytes - structure and function.

24. Free connective tissue cells – types, structure and function.

25. Types of fibers in connective tissue.

26. Intercellular ground substance of connective tissue.

27. Types of connective tissue – characteristics and differences.

28. Microscopic structure of cartilage. Perichondrium.

29. Microscopic structure of bone tissue. Periosteum, endosteum.

30. Intramembranous and endochondral ossification.

31. Primary and secondary ossification. Histophysiology of bone tissue.

32. Erythrocytes – structure and function.

33. Granulocytes – structure and function. Arneth's classification of neutrophils.

34. Agranulocytes – structure and function.

35. Platelets – structure and function.

36. Erythropoiesis - maturation of erythrocytes.

37. Microscopic structure of bone marrow.

38. Skeletal muscle tissue - structure in LM and EM.

39. Sarcoplasmic reticulum and mechanism of contraction.

40. Cardiac muscle tissue - structure in LM and EM.

41. Smooth muscle tissue - structure in LM and EM.

42. Neurons – definition, classification, structure.

43. Nerve fibers – definition, classification, structure.

44. Structure and function of synapses.

45. Efferent nerve endings – myoneural junction, structure in EM. Neurotransmitters.

46. Afferent sensitive nerve endings – structure and function.

47. Neuroglia - types, function and origin.

48. Histologic technic - sampling, fixation, embedding and sectioning of tissues.

49. Histologic technic - staining in the light microscopy. Hematoxylin eosin staining.

50. The principle of transmission and scanning electron microscopy.

II. Microscopic anatomy

1. **Structure and function of hypophysis.**
2. **Neuroendocrine hypothalamo - hypophyseal system. Adenohypophysis.**
3. **Structure and function of thyroid gland.**
4. **Structure and function of parathyroid gland.**
5. **Structure and function of suprarenal gland.**
6. **Microscopic structure of kidney – renal corpuscle, filtration barrier.**
7. **Structure and function of nephron.**
8. **Juxtaglomerular apparatus of kidney.**
9. **Urinary passages.**
10. **Microscopic structure of testis. Blood – testis barrier.**
11. **Intratesticular and extratesticular ducts.**
12. **Accessory genital glands – seminal vesicles, prostate.**
13. **Microscopic structure of ovary, ovarian follicles, corpus luteum.**
14. **Microscopic structure of uterus. Menstrual cycle.**
15. **Structure and function of placenta.**
16. **Mammary gland active and inactive – structure, function.**
17. **Structure and function of the skin. Glands of the skin, hairs and nails.**
18. **Microscopic structure of spinal cord, Rexed laminae. Reflex arch.**
19. **Microscopic structure of cerebellum – cytoarchitecture and impregnoarchitecture.**
20. **Microscopic structure of isocortex - cytoarchitecture and impregnoarchitecture.**
21. **Dorsal root ganglia and peripheral nerve.**
22. **Structure of meninges in the spinal cord and brain.**

23. Fibrous layer of the eye.

24. Vascular layer of the eye. Iris and ciliary body.

25. Retina.

26. External and middle ear.

27. Internal ear – bony and membranous labyrinth.

28. Internal ear - vestibulocochlear apparatus, organ of Corti.

29. Microscopic structure of heart. Conducting system.

30. Microscopic structure of capillaries – types and function.

31. General structure of blood vessels. Elastic and muscular arteries.

32. Microscopic structure of veins. Arteriovenous anastomosis.

33. Structure and function of lymph nodes.

34. Structure and function of spleen.

35. Structure and function of thymus.

36. Pharynx and tonsills of waldayer´s ring.

37. Microscopic structure of larynx and trachea.

38. Structure of bronchi and bronchioles.

39. Respiratory portion of lungs. Structure of alveoli and blood – air barrier.

40. Microscopic structure of salivary glands – secretory part and duct system.

41. Microscopic structure of the tongue and lip.

42. Oral cavity – tongue, palate, minor salivary glands.

43. Microscopic structure of tooth.

44. General structure of the digestive tract, oesophagus.

45. Microscopic structure of stomach.

46. Microscopic structure and function of glands in the stomach.

47. Microscopic structure of small and large intestine.

48. Microscopic structure of pancreas – exocrine and endocrine part.

49. Microscopic structure and blood supply of liver, function.

50. Intrahepatal and extrahepatal biliary tract. Gallbladder.

III. Embryology

1. **Developmental processes – proliferation, migration, differentiation, growth, death.**
2. **Oogenesis.**
3. **Spermiogenesis.**
4. **Fertilization, cleavage of the zygote and development of the blastocyst.**
5. **Implantation and differentiation of the decidua.**
6. **Development of cytotrophoblast, syncytiotrophoblast and primary mesenchyme.**
7. **Development of the fetal membranes – chorion, amnion and yolk sac.**
8. **Development of placenta and umbilical cord. Placenta praevia. Multiple pregnancy.**
9. **Fetal and maternal placenta, placental barrier, function of placenta.**
10. **Anomalies of placenta and umbilical cord development.**
11. **Formation of the two-layered plate – the embryonic disc.**
12. **Formation of the intraembryonic mesoderm.**
13. **Germ layer derivatives. Differentiation of ectoderm.**
14. **Development of notochord and somites.**
15. **Development of the external form of the embryo.**
16. **Early and later heart development. Development of aorta.**
17. **Differentiation of heart – development of atria and ventricles.**
18. **Aortic arches and their derivatives.**
19. **The primitive circulation.**
20. **Prenatal and postnatal circulation.**
21. **Development of neural tube. Histogenesis.**
22. **Development of the spinal cord and histogenesis.**

23. Development of the brain vesicles – differentiation.

24. Development of the hindbrain (rhombencephalon).

25. Development of the eye.

26. Development of the ear.

27. Development of the branchial apparatus.

28. Development of the branchial arches.

29. Development and derivatives of the pharyngeal pouches.

30. Development of the face and neck.

31. Development of nasal and oral cavities. Development of palate.

32. Development of tongue.

33. Development of salivary glands. Tooth development.

34. Development of the foregut.

35. Development of primitive gut and differentiation.

36. Development of oesophagus and stomach - rotation, innervation.

37. Development of gut, rotation of intestines. Development of mesenteries.

38. Development of the liver, biliary apparatus, pancreas and spleen.

39. Partitioning of the cloaca.

40. Development of the body cavities and mesenteries.

41. Development of the lungs. Histogenesis. Lung of a newborn.

42. Pronephros, mesonephros and metanephros.

43. Development of the urinary system.

44. Development of indifferent gonads, development of testis and external genitalia.

45. Development of indifferent gonads, development of ovaries and external genitalia.

46. Development of uterine tube, uterus and vagina.

47. Development of endocrine glands.

48. Development of the cranium (scull). Neurocranium, viscerocranium.

49. Development of axial skeleton.

50. Development of the vertebral column, ribs and limbs.