DEPARTMENT OF HISTOLOGY AND EMBRYOLOGY
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Topics for written final exam from subject „Histology and Embryology 2“ for study programme „General medicine“, AY 2025/2026

A. MICROSCOPIC ANATOMY

1. Cardiovascular system (*systema cardiovasculare*)

1.1. Heart – microscopic structure, conducting system of the heart.

1.2. Arteries – types, microscopic structure and function.

1.3. Veins – types, microscopic structure and function.

1.4. Blood capillaries – types, microscopic structure, location and function.

2. Lymphoid system (*systema lymphoideum*)

2.1. Thymus – microscopic structure and function.

2.2. Lymph node – microscopic structure and function.

2.3. Spleen – microscopic structure, blood circulation and function.

2.4. Waldeyer´s lymphatic ring, Tonsils – microscopic structure and function.

3. Digestive system (*systema digestorium*)

3.1. Tongue and lip – microscopic structure and function.

3.2. Microscopic structure and function of teeth – basic characteristics.

3.3. Salivary glands – classification, structure and function.

3.4. General microscopic structure of the digestive tube.

3.5. Pharynx and oesophagus – microscopic structure and function.

3.6. Stomach – microscopic structure and function.

3.7. Small intestine – segments, microscopic structure and function.

3.8. Large intestine – segments, microscopic structure and function.

3.9. Differences in microscopic structure of the small and large intestine.

3.10. Liver – microscopic structure, function and blood supply of the liver.

3.11. Gall bladder and biliary tract – microscopic structure and function.

3.12. Pancreas – microscopic structure and function.

4. Respiratory system (*systema respiratorium*)

4.1. Nasal cavity. Paranasal sinuses. Larynx and epiglottis – microscopic structure and

function.

4.2. Trachea – microscopic structure and function.

4.3. Bronchial tree – branching of bronchial tree, microscopic structure and function.

4.4. Lungs, lung alveoli, blood-air barrier – microscopic structure and function.

5. Urinary system (*systema urinarium*)

5.1. Kidney – microscopic structure and function.

5.2. Nephron – definition, microscopic structure and function.

5.3. Juxtaglomerular apparatus of the kidney – microscopic structure and function.

5.4. Urinary passages – classification, structure and function.

6. Male reproductive system (*systema genitale masculinum*)

6.1. Testis – microscopic structure and function.

6.2. Spermatogenesis and ultrastructure of the spermatozoon.

6.3. Epididymis and ductus deferens – microscopic structure and function.

6.4. Prostate – microscopic structure and function.

7. Female reproductive system (*systema genitale femininum*)

7.1. Ovary – microscopic structure and function.

7.2. Oogenesis and foliculogenesis – ovarian follicles development – basic characteristics and importance.

7.3. Yellow body – types, development, microscopic structure and function.

7.4. Uterine tube – microscopic structure and function.

7.5. Uterus, uterine cervix – microscopic structure and function.

7.6. Menstrual cycle – definition, description of its phases and importance.

7.7. Vagina – microscopic structure and function

8. Endocrine system (*systema endocrinum*)

8.1. Hypophysis, hypotalamo-hypophyseal system – microscopic structure, function and production of hormones.

8.2. Epiphysis – microscopic structure, function and production of hormones.

8.3. Thyroid gland – microscopic structure, function and production of hormones.

8.4. Parathyroid glands – microscopic structure, function and production of hormones.

8.5. Suprarenal glands – microscopic structure, function and production of hormones.

9. Nervous system (*systema nervosum*)

9.1. Spinal cord – microscopic structure, types of neurons and function.

9.2. Cerebellum – microscopic structure, types of neurons and function.

9.3. Cerebral cortex – microscopic structure, types of neurons and function.

9.4. Meninges and cerebrospinal fluid – microscopic structure and function.

9.5. Peripheral nerve – microscopic structure and function.

9.6. Ganglia – types, microscopic structure and function.

10. Sensory organs and skin (*organa sensuum et intergumentum commune*)

10.1. Fibrous layer of the eye – composition (sclera, cornea), basic microscopic structure and function.

10.2. Vascular layer of the eye – composition (choroidea, ciliary body, iris), basic microscopic structure and function.

10.3. Nervous layer of the eye – composition (retina), basic microscopic structure, types of neurons and function.

10.4. External ear – basic microscopic structure and function.

10.5. Middle ear – basic microscopic structure and function.

10.6. Inner ear. Corti organ, vestibular organ – basic microscopic structure, types of neurons and function.

10.7. Skin and skin derivates (skin glands, hair and hair follicle) – basic microscopic structure and function.

10.8. Mammary gland (breast) – microscopic structure of active and non active mammary gland, secretory function.

B. GENERAL EMBRYOLOGY (EMBRYOGENESIS)

1. Oogenesis.
2. Spermiogenesis.
3. Fertilization. Cortical reaction.
4. Cleavage of the zygote and development of blastocyst.
5. Implantation. Abnormal sites of implantation.
6. Differentiation of trophoblast. Decidual reaction. Decidua.
7. Development of chorion and chorionic villi – types, structure and function.
8. Differentiation of embryoblast. Two-layered embryonic disc.
9. Development of amniotic cavity and yolk sack – types, structure and function.
10. Development of three-layered embryonic disc (gastrulation).
11. Notochord and development of neural tube (neurulation).
12. Neural crest and its derivates.
13. Somites.
14. Development of external form of embryo. Folding of the embryo.

15. Development of the umbilical cord, composition of fully developed umbilical cord and its anomalies.
16. Development of the placenta and its anomalies.
17. Composition and function of fully developed placenta. Fetal and maternal part of placenta. Placentar barrier – microscopic struture and function.

C. EMBRYOLOGY OF ORGANS (ORGANOGENESIS)

1. Development of the heart. Anomalies.
2. Aortic arches – essentials of development (number, main derivates).
3. Primive blood circulation – primitive heart of the embryo, extraembryonic and intraembryonic blood vessels.
4. Prenatal blood circulation. Changes in blood circulation after the birth.
5. Development of respiratory system. Histogenesis of lungs. Importance of surfactant.
6. Development of primitive gut and its derivates – basic characteristics and blood supply of the foregut, midgut and hindgut.
7. Development of the liver, pancreas, gall bladder and biliary tract – basic characteristics.
8. Development of the kidney – basic characteristics of pronephros, mesonephros, metanephros. Anomalies.
9. Cloaca – essentials of development and importance from embryological point of view.
10. Development of indifferent gonads (testis, ovary) – basic characteristics.
11. Wolffian and Müller ducts – importance in development reproductive organs of men and women.
12. Branchial apparatus. Derivates of branchial (pharyngeal) arches, grooves and pharyngeal pouches – essentials of development, blood supply, innervation.
13. Development of the face. Anomalies – basic characteristics.
14. Development of the oral cavity and palate – basic characteristics.
15. Development of the nasal cavity – basic characteristics.
16. Main stages of the tooth development.
17. Development of the tongue – origin of its parts, innervation.
18. Development of endocrinne glands (hypophysis, adrenal glands, thyroid gland, parathyroid glands) – origin and basic characteristics.
19. Development of the spinal cord. Anomalies.
20. Development of the brain – basic characteristics of brain vesicles. Anomalies.
21. Essentials of development of the eye.
22. Essentials of development of the external, middle and internal ear.
23. Characteristics of a full-term fetus.