Comenius University Bratislava
Faculty of Medicine
Institute of Histology and Embryology

Dean's Office FM CU
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prof. RNDr. Ivan Varga, PhD. *et* PhD.
Head of the Institute

Examination questions from Cytology, Histology and Embryology for the study programme Dentistry, 1st year, academic year 2026/2027

A. CYTOLOGY AND GENERAL HISTOLOGY

1. Principles of tissue processing for histological examination
2. Principles and applications of light microscopy
3. Morphological and functional characteristics of the cell. Morphological description of apoptosis and necrosis
4. Cytoplasm; structure and function of the cell membrane
5. Structure and function of nucleus in the interphase (nucleolus, chromatin, nuclear envelope)
6. Structure and function of membranous organelles (mitochondria, endoplasmic reticulum, Golgi apparatus, lysosomes and peroxisomes)
7. Morphological characteristics of protein synthesis in the cell. Ribosomes
8. Cytoskeleton of the cell. Microtubules and microfilaments. Centrioles, basal bodies and cilia
9. Cell junctions. Cell surface specificities
10. Cell inclusions and pigments. Endocytosis and exocytosis
11. Epithelial tissue (general characteristics, nutrition and function of epithelia). Structure of the *membrana basalis* and *lamina basalis*
12. Covering and lining epithelia. Structure, classification and examples of localization
13. Glandular epithelia (exocrine and endocrine glandular epithelia)
14. Connective tissue (classification and structure). Fibres of connective tissue (types, function and staining)
15. Loose connective tissue (structure and functional histology). Cells of loose connective tissue
16. Dense connective tissue (structure and functional histology). Microscopic structure of tendons, ligaments and aponeuroses
17. Special types of connective tissue: mucoid (gelatinous), reticular, elastic, white and brown adipose tissue (structure, location and functional histology)
18. Cartilage: hyaline, elastic and fibrocartilage (structure, location and functional histology)
19. Bone tissue. Immature (woven) and mature bone (microscopic structure). Bone cells
20. Lamellar bone. Haversian systems. Periosteum and endosteum (structure and functional histology)
21. Intramembranous and endochondral ossification. Primary and secondary bone
22. Epiphyseal growth plate. Bone remodelling and fracture healing
23. Microscopic structure of the joint and synovial membrane
24. Muscle tissue (types, structure and functional histology). Regeneration and innervation of muscle tissue
25. Myocardium (structure and functional histology)
26. Striated skeletal muscle. Smooth muscle (structure and functional histology)
27. Nervous tissue (structure and function). Degeneration and regeneration of the nervous system.

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28. Neurons. Nerve fibres and myelination. Synapses
29. Neuroglia (cell types, structure and functional histology). Blood–brain barrier
30. Microscopic structure of the gray and white matter of the CNS
31. Composition of blood. Morphology and development of erythrocytes and thrombocytes
32. Morphology and development of leukocytes. Mononuclear phagocyte (monocyte–macrophage) system
33. Blood smear and differential white blood cell count (leukogram)
34. Morphological overview of haemopoiesis. Myelopoiesis and erythropoiesis. Structure of bone marrow.

B. DEVELOPMENT AND MICROSCOPIC ANATOMY OF STRUCTURES AND ORGANS OF THE CRANIOFACIAL REGION

1. Development of the cephalic end of the embryo. Pharyngeal arches, clefts and their derivatives. Anomalies
2. Pharyngeal pouches and their derivatives. Anomalies
3. Development of the face. Development of the oral cavity. Congenital anomalies of the face and oral cavity (orofacial malformations).
4. Development and structure of the lip
5. Development of the primary and secondary palate. Clefts
6. Microscopic structure of the soft and hard palate
7. Oral mucosa, minor salivary glands (structure and development). Saliva
8. Tonsils (microscopic structure and location)
9. Development, structure and congenital anomalies of the tongue. Sensory epithelium of the tongue
10. Development and microscopic structure of the major salivary glands
11. Development of the nasal cavity and paranasal sinuses
12. Microscopic structure of the nasal cavity. Olfactory region
13. Tooth development and its developmental stages. Anomalies and dislocations of teeth
14. Amelogenesis. Ameloblasts: origin, structure and function
15. Microscopic structure and composition of enamel. Mineralization and its maturation of the enamel.
16. Dentinogenesis. Origin, structure and function of odontoblasts
17. Microscopic structure and composition of dentin. Predentin and its mineralization.
18. Development of the root of the tooth. Cementoblasts. Cementum (microscopic structure and composition)
19. Development and microscopic structure of the dental pulp (topographic regions, innervation and blood supply)
20. Microscopic structure of the gingiva, its topographic regions and function
21. Dentogingival junction. The alveolar bone socket and the periodontium (development, structure, function and blood supply)
22. Development and growth of the skull. Temporomandibular joint (development and microscopic structure)
23. Development of the neural tube. Neural crest and its derivatives

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24. Microscopic structure of the cerebral cortex and cerebellum
25. Microscopic structure of the spinal cord
26. Microscopic structure of the peripheral nerve and ganglia

C. DEVELOPMENT AND MICROSCOPIC ANATOMY OF STRUCTURES AND ORGANS OUTSIDE THE CRANIOFACIAL REGION. EMBRYOLOGY

1. Arteries and veins (types, microscopic structure and differences in their structure)
2. Types of capillaries, their microscopic structure and function
3. Heart (microscopic structure and function). The conducting system of the heart
4. Thymus and lymph node (microscopic structure and function)
5. Pharynx and oesophagus (microscopic structure and function).
6. Stomach and pancreas (microscopic structure and function)
7. Small and large intestine (microscopic structure and function)
8. Liver, gallbladder and biliary ducts (microscopic structure, function)
9. Larynx and epiglottis (microscopic structure, function)
10. Trachea and branches of the bronchial tree (microscopic structure and function)
11. Lungs (microscopic structure and function). Respiratory portion of the lung. Blood–air barrier
12. Kidney (microscopic structure and function). Structure of the nephron (microscopic structure and function)
13. Excretory urinary passages, urinary bladder and urethra (microscopic structure and function)
14. Ovary, uterine tube and uterus (microscopic structure and function)
15. Testis, ductus deferens, penis (microscopic structure and function)
16. Skin and its appendages (microscopic structure and function).
17. Fertilization. Cleavage of the zygote and development of the blastocyst. Implantation. Differentiation of the trophoblast. Decidual reaction
18. Development of the germ layers (bilaminar and trilaminar embryonic disc). Overview of germ layer derivatives
19. Development of the embryo in the 3rd and 4th week
20. Somites and their derivatives
21. Development of the vertebrae and vertebral column. Development of the limbs

Bratislava, 7 September 2026

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