Test specification

Intended examinee population:	Students (3rd year)
Educational program:	"Dentistry"
Aim:	Assessment of the achievement of final learnin outcomes in basic disciplines of integrated medica education programs
Assessment Format:	Assessment of knowledge and skills (computer-base testing) 150 MCQ A-type questions Block 1 (knowledge assessment): 150 test questions Block 2 (skills assessment): 10 test questions Duration: 210 minutes (without a break) Passing threshold: Block 1: 75 points (50%) Block 2: 5 points (50%)

№	Key questions/	Weight %	Number of TQ
1.	Biochemistry • Functioning of proteins and enzymes; fundamentals of energy metabolism.		**1**
2.	Cell Biology • Processes of gene expression, DNA replication, transcription, and translation. • Cellular adaptive responses; mechanisms of injury, necrosis, and apoptosis. • Regulation of the cell cycle and mechanisms of its dysregulation.		3
3.	Human Genetics and Development • Pedigree analysis and principles of population genetics. • Mechanisms of inheritance, mutations, and principles of genetic counseling.		2
4.	Cardiovascular System • Structure of the heart, its chambers, valvular apparatus, and major vessels. • Structure of the vascular wall (arteries, veins, capillaries). • Cardiac cycle, cardiac output, and regulation of stroke volume. • Mechanisms of arterial pressure regulation. • Principles of systemic and pulmonary circulation.		5
5.	Respiratory System • Structure of the airways and lungs. • Epithelial composition of the airways and structure of alveoli. • Mechanics of breathing. • Gas exchange processes and ventilation–perfusion ratio. • Features of pulmonary and bronchial blood flow.		5
6.	Digestive System • Structure of the esophagus, stomach, small and large intestines. • Structure of the liver, pancreas, and biliary system.		5

	• Layers of the GI tract wall and their regional differences. • Major processes of digestion, secretion, and absorption. • Liver functions and mechanisms of bile secretion.		
7.	Nervous System • Structure of the brain and spinal cord. • Divisions of the central and peripheral nervous systems. • Structure of neurons and glial cells. • Nerve impulse conduction and principles of synaptic transmission; types of sensation and mechanisms of autonomic regulation.		5
8.	Endocrine System • Identification of major endocrine glands and their structure. • Microstructure of hormone-producing cells and glands. • Mechanisms of hormonal regulation and feedback control.		3
9.	Hematopoietic and Immune Systems • Identification of immune-hematopoietic organs (lymph nodes, spleen, thymus). • Hematopoietic lineages and their functions. • Explanation of the gas-transport function of blood. • Main stages of the immune response (innate/adaptive). • Mechanisms of hemostasis and fibrinolysis.		5
10.	Urinary System • Description of the structure of the kidneys, nephron, and urinary tract. • Microstructure of the nephron. • Processes of filtration, reabsorption, and secretion. • Regulation of water–electrolyte balance and the RAAS.		4
11.	Musculoskeletal System • Macro- and microstructure of bone tissue. • Major types of joints and their functions.		3

	• Mechanism of muscle contracion.		
12.	Pharmacology • Pharmacokinetics and pharmacodynamics of drugs. • Mechanisms of drug action, interactions, and toxicity; individual variability factors.		2
13.	Microbiology • Major groups of bacteria, viruses, fungi, and parasites. • Key mechanisms of pathogenicity and principles of microorganism identification.		2
14.	Social Sciences and Ethics • Communication skills and patient-centered interaction. • Principles of medical ethics, informed consent, and confidentiality; understanding of patient safety fundamentals. • Patient communication skills, including history taking and informed consent.		3
15.	Biostatistics • Interpretation of sensitivity, specificity, and predictive values of diagnostic tests. • Basic methods of data analysis and principles of epidemiology		2
16.	Anatomy of the Orofacial Region • Anatomical structure of the teeth of the maxilla and mandible • Morphological differences between tooth groups and identification features • Structure of the oral cavity and topography of its compartments • Elements of the temporomandibular joint and their functions • Anatomy of the teeth of the upper and lower jaws • Types of occlusal contacts and explanation of their physiological significance • Major anatomical landmarks of the orofacial region important for clinical procedures		11

	• Topographic relationships of structures for safe performance of dental procedures		
17.	Histology of the Orofacial Region • Stages of tooth and periodontal embryogenesis • Histology of enamel, dentin, cementum, and pulp • Histological structure of the periodontium and oral mucosa • Morphological features of hard and soft tissues in normal conditions • Influence of embryogenesis disorders on the development of dental and jaw anomalies • Histological tissue changes associated with clinical manifestations of diseases		6
18.	Physiology of the Orofacial Region • Physiology of mastication, swallowing, and speech • Mechanisms of salivation and functions of saliva • Types of oral cavity sensitivity and their physiological mechanisms • Neuromuscular regulation and physiological parameters required for normal occlusion • Physiological deviations with clinical symptoms of dental diseases		6
19.	Oral Microbiology and Immunology • Normal microflora of the oral cavity • Pathogenic microorganisms involved in the development of caries and periodontitis • Mechanisms of biofilm formation • Local immune responses of the oral mucosa • Stages of the inflammatory process in microbial lesions		6

	• Role of microbial factors in the development of major dental diseases		
20.	Biochemistry of Dental Hard Tissues • Interpretation of protein and enzyme function and basics of energy metabolism • Processes of enamel and dentin mineralization • Mechanisms of demineralization and remineralization • Role of calcium, fluoride, phosphates, and matrix proteins • Biochemical basis of caries development • Factors influencing the resistance of hard tissues to damage • Selection of remineralizing agents from a biochemical perspective		8
21.	Pathological Anatomy • Morphological changes in dental hard tissues in caries • Morphology of pulpitis and periodontitis • Types of non-carious lesions of hard tissues • Morphological features of benign and precancerous conditions • Pathological tissue changes with clinical manifestations • Stages of damage to hard and soft tissues based on morphological criteria		6
22.	Pathophysiology • General patterns of disease development (etiology, pathogenesis, outcomes) • Main types of tissue damage and cellular responses • Mechanisms of acute and chronic inflammation • Key pathophysiological mechanisms of pain in dentistry		10

	• Mechanisms of microcirculation disorders and their role in dental diseases • Mechanisms of immunopathological processes • Mechanisms of tissue repair and regeneration • Pathophysiological basis of systemic diseases affecting oral health • Pathophysiological mechanisms with clinical manifestations of major dental diseases		
23.	Pharmacology for Dentistry • Mechanism of action of local anesthetics • Types of anesthetics and their clinical use • Principles of antibacterial therapy in dentistry • Main groups of antibacterial drugs used in dentistry • Spectrum of activity of antibacterial agents relevant to orofacial infections • Main groups of antifungal drugs used for oral candidiasis • Indications for antifungal therapy • Drugs used for herpetic infections of the oral cavity • Indications and limitations for antiviral therapy • NSAIDs and other drugs for pain and inflammation control • Drug groups used for premedication (sedatives, antihistamines) • Main groups of hemostatic agents • Mechanisms of action of major hemostatic drugs • Local hemostatic agents used in dentistry • Indications for hemostatic use during dental procedures • Mechanism of action of glucocorticosteroids • Evaluation of indications for glucocorticosteroid use in		23

	dentistry (edema, allergy, mucositis) • Main antiseptics (chlorhexidine, povidone-iodine, hydrogen peroxide, metronidazole gels) • Mechanism of action and spectrum of activity of antiseptics • Main second-generation antihistamines • Indications for antihistamine use in dentistry • Fluoride-containing and calcium-phosphate remineralizing agents		
24.	Fundamentals of Dentistry • Tooth identification features • Dental instruments used in therapeutic dentistry • Black's classification of carious lesions • Preparation of carious cavities of Classes I–VI • Stages of restoring dental hard tissues in caries and explanation of material selection depending on lesion depth • Use of composite restorative materials (chemical-cure and light-cure) • Knowledge of normal and pathological occlusion • Major risk factors for dental diseases (caries, periodontitis, stomatitis, mucosal diseases) • Modern preventive methods: oral hygiene, rational nutrition, fluoride prophylaxis, remineralizing therapy • Rules of dental examination • Methods of tooth assessment • Assessment of periodontal tissues during examination • Rules for measuring blood pressure and pulse • Interpretation of complete blood count in normal conditions and inflammation • Basics of oral hygiene indices and their practical significanc		16

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25.	Dental Materials and Adhesive Systems • Properties of composites, glass ionomer cements, and other restorative materials • Materials for temporary fillings (dentin powder, dentin paste) • Dental materials and adhesive systems (Fundamentals of Dentistry) • Materials for therapeutic liners (calcium-containing, combined) • Principles of adhesive systems (etchant/conditioner, primer, bond) • Dental cements (glass ionomer cements, polycarboxylate cements) • Generations of adhesive systems and their characteristics • Material properties relevant to selecting a method for restoring tooth defects • Factors influencing adhesion and the longevity of restorations		8
	Overall		150
1.	Basic methods of dental examination		1
2.	Additional diagnostic methods in dentistry		1
3.	Types of anesthesia for extraction of maxillary teeth		1
4.	Types of anesthesia for extraction of mandibular teeth		1
5.	Rules for measuring blood pressure and pulse		1
6.	Interpretation of complete blood count in normal and pathological conditions		1
7.	Microscopic slide of an organ: identification of tissue, layers, and cell types		1
8.	Tooth-brushing methods		1
9.	Determination of oral hygiene indices		1
10.	Preparation of carious cavities according to Classes I–VI		1
	Overall		10