

Test specification

Contingent:	Students (3 course)
Educational program:	«General medicine»
Aim:	Assessment of student attainments of learning outcomes in foundational disciplines of integrated medical education program

Assessment format:	<p>1st step – Assessment of knowledge (Computer testing) 150 test questions (MCQ A-type: Test questions on 'Memory' (A), Test questions on 'Understanding' (B))</p> <p>Duration: 180 minutes (without a break)</p> <p>Passing level: 50 points</p> <p>2nd step – Practical skills evaluation:</p> <p>Number of stations OSCE/OSPE -5,</p> <p>Duration: 75 minutes (15 minutes per 1 station)</p> <p>Passing level: 50 points</p>
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№	Key questions/processes/	Specific weight, in %	Number of test questions	Cognitive level
General principles of fundamental science				
1	Biochemistry and molecular biology <ul style="list-style-type: none"> Gene expression: DNA structure, replication, recombination, and epigenetics, gene transcription, translation, post-translational processing, modifications, and protein localization (degradation). Structure and function of proteins and enzymes. Energy metabolism. 		3	A-1 B-2
2	Cell biology <ul style="list-style-type: none"> Adaptive cellular responses and cellular homeostasis, mechanisms of damage and necrosis, including pathological processes, apoptosis. Cell cycle and regulation of the cell cycle. Mechanisms of dysregulation. Structure, regulation, and function of cells/tissues. 		3	A-1 B-2
3	Human development and genetics <ul style="list-style-type: none"> Principles of pedigree analysis. Population genetics: Hardy-Weinberg law. Mutation and selection equilibrium. Principles of gene therapy. 		3	A-1 B-2

	<ul style="list-style-type: none"> Genetic testing and counseling. Genetic mechanisms. 			
4	Biology of tissue response to disease <ul style="list-style-type: none"> Acute inflammatory reactions (response samples). Chronic inflammatory reactions. Repair processes. 		3	A-1 B-2
5	Pharmacology <ul style="list-style-type: none"> Pharmacodynamic and pharmacokinetic processes. Pharmacokinetics: absorption, distribution, metabolism, excretion, dosing intervals. Mechanisms of drug action, structure-activity relationship. Relationship between concentration and dose-effect. Mechanisms of drug interactions. Individual factors influencing pharmacokinetics and pharmacodynamics. 		4	A-1 B-3
6	Microbiology <ul style="list-style-type: none"> Bacteria Viruses Fungi Parasites 		4	A-0 B-4
7.1	Immune system -1 <ul style="list-style-type: none"> Development of cells of the adaptive immune response. Structure, production, and functions. Cellular basis of the immune response and immunological mediators. Foundations of immunological protection. Effect of age on immune system components. 		4	A-1 B-3
7.2	Immune system -2 (Pathological processes) <ul style="list-style-type: none"> Disorders associated with immunodeficiency (HIV/AIDS). Immunologically mediated disorders. Adverse drug effects on the immune system. 		4	A-0 B-4
8.1	Hematopoietic system - 1 <ul style="list-style-type: none"> Embryonic development, fetal maturation, and perinatal changes Structure and functions of the organ. Structure and functions of cells/tissues 		3	A-1 B-2

	<ul style="list-style-type: none"> • Restoration, regeneration, and changes related to life stages 			
8.2	Hematopoietic System - 2 (Pathological Processes) <ul style="list-style-type: none"> • Infectious-immunological processes. • Neoplasms. Anemia, cytopenia, and polycythemia. • Coagulation disorders (hypocoagulation and hypercoagulation states). Traumatic, mechanical, and vascular disorders. • Adverse effects of drugs on the hematological and lymphoreticular systems. 		3	A-0 B-3
9.1	Nervous system-1 <ul style="list-style-type: none"> • Embryonic development, fetal maturation, and perinatal changes. • Structure and functions of the organ. Structure and functions of cells/tissues, including neuronal cellular and molecular biology, restoration, regeneration, and age-related changes 		2	A-1 B-1
9.2	Nervous system -2 (Pathological processes) <ul style="list-style-type: none"> • Infectious, immunological, and inflammatory diseases. Sleep disorders. Congenital disorders. • Neoplasms (cerebral, spinal, and peripheral). • Cerebrovascular diseases. Traumatic and mechanical disorders, and increased intracranial pressure disorders. • Diseases related to the spine, spinal cord, and spinal nerve roots. Diseases of cranial and peripheral nerves. • Neuromuscular disorders. • Motor disorders. • Degenerative disorders / amnesic syndromes. • Global cerebral dysfunction. • Metabolic disorders. • Paroxysmal disorders. • Adverse drug effects on the nervous system. 		6	A-1 B-5
10	Sensory Organs <ul style="list-style-type: none"> • Structure and functions of the sensory organs (eyes, ears, olfactory organs, and touch). 		3	A-1 B-2

	<ul style="list-style-type: none"> • Eye and eyelid diseases. • Ear diseases. 			
11	Mental health disorders: <ul style="list-style-type: none"> • Types of disorders: <ul style="list-style-type: none"> - Psychotic disorders - Anxiety disorders - Mood disorders - Somatoform disorders - Factitious disorders - Eating disorders and impulse control disorders • Diseases of infancy/childhood. • Psychosocial disorders/behavior. Disorders related to the use of psychoactive substances		2	A-0 B-2
12.1	Skin and subcutaneous tissue -1 <ul style="list-style-type: none"> • Embryonic development, fetal skin maturation, and changes in newborns. Structure and function of the skin, including its barrier function and thermoregulation. Structure and function of cells and tissues, including sweating. • Repair, regeneration, and changes associated with stages of life. Mechanisms of skin protection and normal flora. 		3	A-1 B-2
12.2	Skin and subcutaneous tissue -2 <ul style="list-style-type: none"> • Pathological processes • Infectious, immunological, and inflammatory diseases. • Neoplasms, pigmentation disorders. • Skin disorders (hair and hair follicles, nails, sweat glands, sebaceous glands). Traumatic and mechanical disorders. Congenital disorders. • Adverse drug effects on skin and subcutaneous tissue. 		3	A-0 B-3
13.1	Musculoskeletal System -1 <ul style="list-style-type: none"> • Embryonic development, fetal maturation, and perinatal changes. • Structure and function of the organ. Structure and function of cells/tissues, restoration, regeneration, and changes associated with stages of life. 		3	A-2 B-1
13.2	Musculoskeletal System - 2 <ul style="list-style-type: none"> • Pathological processes 		5	A-0 B-5

	<ul style="list-style-type: none"> • Infectious, inflammatory, and immunological disorders. • Neoplasms. • Degenerative and metabolic disorders. • Traumatic and mechanical disorders. • Congenital disorders. • Adverse drug effects on the musculoskeletal system. 			
14.1	Cardiovascular system-1 <ul style="list-style-type: none"> • Embryonic development, fetal maturation, and perinatal transitional changes. • Structure and functions of the heart. • Structure and functions of cells/tissues, restoration, regeneration, and changes associated with stages of life. • Circulatory circuits. • Blood supply, venous, and lymphatic drainage of the head and neck. • Blood supply, venous, and lymphatic drainage of the thoracic organs. • Blood supply, venous, and lymphatic drainage of the abdominal organs. • Blood supply, venous, and lymphatic drainage of the pelvic organs. • Blood supply, venous, and lymphatic drainage of the upper and lower extremities. 		9	A-2 B-7
14.2	Cardiovascular system -2 <ul style="list-style-type: none"> • Pathological processes • Infectious, immunological, and inflammatory diseases. • Neoplasms. • Arrhythmias. • Heart failure. • Ischemic heart disease. • Myocardial diseases. • Pericardial diseases. • Valvular heart disease. • Congenital disorders, including diseases in adults. • Traumatic and mechanical disorders. • Vascular disorders. • Hypotension, Hypertension. 		9	A-2 B-7

	<ul style="list-style-type: none"> • Adverse drug effects on the cardiovascular system. 			
15.1	Respiratory System - 1 <ul style="list-style-type: none"> • Embryonic development, fetal maturation, and perinatal changes. • Structure and function of cells/tissues, including surfactant production and alveolar structure, restoration, regeneration, and changes associated with stages of life. • Pulmonary defense mechanisms and normal flora. 		5	A-2 B-3
15.2	Respiratory System -2 <ul style="list-style-type: none"> • Pathological processes • Infectious, immunological, and inflammatory diseases. • Neoplasms. • Obstructive airway disease. • Pneumoconiosis / fibrosis / restrictive lung diseases / interstitial lung disease. • Respiratory failure / apnea and pulmonary vascular diseases. • Metabolic, regulatory, and structural disorders. • Diseases of the pleura, mediastinum, and chest wall. • Traumatic and mechanical disorders. • Congenital disorders. • Adverse drug effects on the respiratory system. 		9	A-2 B-7
16.1	Gastrointestinal system-1 <ul style="list-style-type: none"> • Embryonic development, fetal maturation, and perinatal changes. • Structure and function of the organ. • Structure and functions of cells/tissues. • Regeneration and changes associated with stages of life. • Protective mechanisms of the gastrointestinal tract and normal flora. 		5	A-1 B-4
16.2	Gastrointestinal system – 2 <ul style="list-style-type: none"> • Pathological processes • Infectious, immune, and inflammatory diseases. • Signs, symptoms, and undetermined disorders. • Neoplasms. 		10	A-2 B-8

	<ul style="list-style-type: none"> • Diseases of the mouth, salivary glands, and esophagus. • Diseases of the stomach, small intestine, large intestine, rectum, and anus. • Liver and biliary system diseases, non-infectious. • Diseases of the pancreas. • Traumatic and mechanical disorders. • Congenital disorders. • Adverse drug effects on the gastrointestinal tract. 			
17.1	Urinary system - 1 <ul style="list-style-type: none"> • Embryonic development, fetal maturation, and perinatal changes • Structure and functions of the organ • Structure and functions of cells/tissues • Restoration, regeneration, and age-related changes 		3	A-2 B-1
17.2	Urinary system - 2 <ul style="list-style-type: none"> • Pathological processes • Infectious, immunological, and inflammatory diseases • Neoplasms • Vascular disorders • Metabolic and regulatory disorders • Traumatic and mechanical disorders • Congenital disorders • Drug side effects on the renal and urinary system 		5	A-1 B-4
18.1	Male reproductive system - 1 <ul style="list-style-type: none"> • Embryonic development, fetal maturation, and perinatal changes • Structure and functions of the organ • Structure and functions of cells/tissues • Protective mechanisms of the reproductive system and normal flora • Restoration, regeneration, and age-related changes 		3	A-2 B-1
18.2	Male reproductive system – 2 <ul style="list-style-type: none"> • Pathological processes • Infectious, immunological, and inflammatory diseases. Fertility and infertility. Sexual dysfunction. Traumatic and mechanical disorders. Congenital disorders 		5	A-1 B-4

	<ul style="list-style-type: none"> • Drug side effects on the male reproductive system 			
19.1	Female reproductive system –1 <ul style="list-style-type: none"> • Embryonic development, fetal maturation, and perinatal changes • Structure and functions of the uterus, fallopian tubes, and ovaries • Physiological pregnancy. Antenatal care. Labor. Newborn (from birth to 4 weeks of age) 		3	A-2 B-1
19.2	Female reproductive system –2 <ul style="list-style-type: none"> • Pathological processes • Systemic Disorders Affecting Pregnancy, Labor, and the Postpartum Period. Congenital Pathologies of Newborns • Adverse effects of drugs on pregnancy, labor, and the postpartum period 		2	A-0 B-2
20.1	Endocrine System – 1 <ul style="list-style-type: none"> • Embryonic development, fetal maturation, and perinatal changes • Structure and functions of endocrine glands • Restoration, regeneration, and age-related changes 		3	A-1 B-2
20.2	Endocrine System – 2 <ul style="list-style-type: none"> • Pathological processes • Diabetes mellitus and other pancreatic endocrine disorders • Thyroid and parathyroid disorders • Adrenal disorders • Pituitary and hypothalamic disorders • Congenital disorders • Drug side effects on the endocrine system 		6	A-1 B-5
21	Multisystem Processes and Disorders <ul style="list-style-type: none"> • Electrolyte and fluid balance disturbances • Disorders of fluid, electrolyte, and acid-base balance • Cardiogenic shock • Hypovolemic shock • Septic shock. Sepsis, bacteremia, systemic inflammatory response syndrome (SIRS) • Multiple organ dysfunction syndrome (MODS) • Drug side effects in multisystem disorders 		7	A-1 B-6
22	Social Sciences		5	A-2

	<ul style="list-style-type: none"> • Communication and interpersonal skills, including patient interviews, consultations, and family interactions (patient-centered communication skills, doctor-patient relationship) • Medical Ethics and Jurisprudence: <ul style="list-style-type: none"> - Professional behavior / integrity - Ethics (informed consent, patient confidentiality, regulatory issues) - Consent for treatment / decision-making capacity - Death and palliative care - Doctor-patient relationship - Patient safety (including basic concepts and terminology) 			B-3
	Total		150	

Skills list (OSCE/OSPE):

1. Physical examination of the patient: comparative percussion of lungs.
2. Physical examination of the patient: auscultation of the heart in normal condition.
3. Fundamentals of laboratory research: analysis and interpretation of a complete blood count in normal and pathological conditions.
4. Performing the algorithm of measuring blood pressure.
5. Procedural skills: parenteral administration of medicinal substances.