AL-FARABI KAZAKH NATIONAL UNIVERSITY
Faculty of Medicine and Healthcare
Higher School of Medicine
Department of Fundamental Medicine

Final exam program of
MiF2203 "Normal structure and function of human body" (11 ECTS)
Spring semester 2021-2022 academic year

Topics for the final exam

1. Histology The Sensory Organs I Organ of sight, organ of smell. Organs of hearing and balance, taste.
2. The Autonomic Nervous System I General Properties of the Autonomic Nervous System
3. Anatomy of the Autonomic Nervous System
4. The Autonomic Nervous System II Autonomic Effects on Target Organs
5. Central Control of Autonomic Function
6. The nervous System -The Sensory Organs I Properties and Types of Sensory Receptors
7. The General Senses; The Chemical Senses
8. The Chemical Senses—Taste and Smell
9. Eye and Vision
10. Hearing and Equilibrium
11. Overview of the Endocrine System The Hypothalamus and Pituitary Gland
12. Other Endocrine Glands
13. Hormones and Their Actions
14. Histology of Endocrine System I Microscopic Anatomy of endocrine organs and tissue Endocrine system. Central endocrine system. Hypothalamus, pituitary, pineal gland.
15. Hormones and Their Actions Endocrine Disorders
16. Stress and Adaptation Eicosanoids and Other Signaling Molecules
17. Histology Microscopic Anatomy of endocrine organs and tissue Peripheral endocrine system. Adrenal gland, thyroid, parathyroid glands.
18. Human tissue 7: Respiratory system. Nasal cavity, trachea, bronchi, bronchioles, alveolar ducts.
19. The Respiratory System 1: Anatomy of the Respiratory System
20. The Respiratory System 2: Pulmonary Ventilation
21. The Respiratory System 3: Gas Exchange and Transport
22. The Respiratory System 4: Respiratory Disorders
23. Human tissue 8: Human tissue 8.Histology of urinary system
24. The urinary System 1: Functions of the Urinary System. Anatomy of the Kidney
25. The urinary System 2: Urine Formation I: Glomerular Filtration
26. The urinary System 3: Urine Formation II:Tubular Reabsorption and Secretion
27. Human tissue 9: Histology of urinary system
28. The urinary System 4: Urine Formation III: Water Conservation
29. The urinary System 5: Urine and Renal Function Tests. Urine Storage and Elimination
30. The lymphatic system and Immune system
31. Fluid Balance and Electrolyte Balance
32. Acid–Base Balance
33. Histology of the Lymphatic System Cells of the lymphatic system, types of lymphatic tissue, red bone marrow, thymus, lymph nodes, tonsils, and spleen:
34. General Anatomy and Digestive Processes The Mouth Through Esophagus
35. The Stomach, The Liver, Gallbladder, and Pancreas
36. The Small Intestine and Large Intestine

37. Histology of digestive system Microscopic Anatomy of digestive organs and tissue II Topic: Digestive system. Middle section: small intestine, colon, duodenum
38. Nutrition
39. Metabolic States and Metabolic Rate
40. Body Heat and Thermoregulation
41. Histology of digestive system II Microscopic Anatomy of
42. digestive organs and tissue III Liver, pancreas
43. Histology Sexual Reproduction and Development
44. Histology Reproductive System Male reproductive system. The male Reproductive system Male Reproductive Anatomy
45. Histology Female reproductive system: structure and functions of the ovary, ovogenesis, fallopian tubes.
46. Female reproductive system: structure and functions of the uterus, vagina, ovarian-menstrual cycle; age-related changes; hormonal regulation.
47. The male Reproductive System Sperm and Semen Male Sexual Response
48. Reproductive Anatomy: structure and functions of the ovary, ovogenesis, fallopian tubes.
49. Histology Sex cells. Early stages of development of the human embryo.
50. Oogenesis and the Sexual Cycle Female Sexual Response
51. Pregnancy and Childbirth Lactation
52. Fertilization. Splitting up. Cleavage. Implantation
53. Cleavage. Implantation
54. Human embryology Gastrulation. Differentiation of germ layers, organogenesis.
55. Extraembryonic organs – amnion, yolk sac, chorion, placenta, umbilical cord

Learning outcomes

Students in the final exam must demonstrate the ability to:

1. demonstrate knowledge of anatomy and physiology of autonomic nervous system
2. demonstrate knowledge of anatomy and physiology of special senses organs
3. demonstrate knowledge of anatomy and physiology of endocrine system
4. demonstrate knowledge of anatomy and physiology of respiratory system
5. demonstrate knowledge of anatomy and physiology of urinary system
6. demonstrate knowledge of anatomy physiology of lymphatic system
7. demonstrate knowledge of physiology of water and electrolyte balance, acid and base balance.
8. demonstrate knowledge of anatomy, topography and visualization in the age and sexual aspects of human organ systems;
9. be able to identify cellular and non-cellular structures that make up the tissues of organ systems on microscopic specimens with an understanding of their formation and function;
10. demonstrate knowledge of the physiological processes that determine the activity and mechanisms of regulation of human organs and systems (digestion, excretion, movement, blood formation, functioning of the senses);
11. understand and apply knowledge of the neuro-endocrine regulation of homeostasis, metabolism in different situations;
12. understand the processes and anatomical and physiological processes during pregnancy, development and growth, involutional changes, with various physiological stress variants;
13. be able to conduct research on basic physiological functions;
14. demonstrate analytical skills in the integration of knowledge of the anatomy, histology and function of the human body to understand and evaluate normal life processes.
15. demonstrate the ability to identify learning gaps and create strategies to enhance one's own knowledge and skills.
16. communicate effectively with other students and teachers regarding medical and scientific information, articulate their opinions clearly when discussing the morphological structure and physiological processes, and work effectively as a member of the team.

An approximate typology of tasks for the exam

1	**Autonomic nervous system and Special Senses**	*Explain how the ANS controls many target organs through dual innervation;* *Reproduce simple and complex reflex arcs typical of the somatic and autonomic nervous system, taking into account their characteristics at the organ and cellular levels.* *Give examples of neurotransmitters and neuromodulators and describe their actions;* *Describe the microscopic anatomy of the ear, the eye, organ of taste and smell.* *Define receptor and sense organ;* *Explain how the two divisions of the autonomic nervous system differ in general function.* *Discuss the relationship of the adrenal glands to the sympathetic nervous system;* *Identify the properties of sound waves that account for pitch and loudness;*
2	**Endocrine system**	*Name several organs of the endocrine system;* *Contrast endocrine with exocrine glands;* *Recognize the standard abbreviations for many hormones;* *Describe similarities and differences between the nervous and endocrine systems;* *Define hormone and endocrine system; name several organs of the endocrine system;* *Contrast endocrine with exocrine glands;* *Recognize the organs of the endocrine system on their constituent tissue elements at the microscopic and ultramicroscopic levels.* *Characterize the embryonic sources of development and the general laws of the structure, morphofunctional features of the organs of the endocrine system.* *Describe the microscopic anatomy of portion of the endocrine system.* *Identify the chemical classes to which various hormones belong;* *Describe how hormones are synthesized and transported to their target organs;* *Describe how hormones stimulate their target cells;* *Discuss how the body adapts to stress through its endocrine and sympathetic nervous systems. explain what eicosanoids are and how they are produced;*
3	The Respiratory System: - nasal cavity, trachea, bronchi,bronchioles, alveolar ducts - Anatomy of the Respiratory System - Pulmonary Ventilation - Gas Exchange and Transport	*Describe the basic components of the conducting and respiratory portions of the system (nasal cavity, trachea, bronchi,bronchioles, alveolar ducts) structural elements the blood-air barier identification of structural components of the nasal cavity, trachea, bronchi, bronchioles under microscope and on the photomicrographs*

	- Respiratory Disorders	*state the functions of the respiratory system; name and describe the organs of this system; trace the flow of air from the nose to the pulmonary alveoli; relate the function of any portion of the; respiratory tract to its gross and microscopic anatomy.* *name the muscles of respiration and describe their roles in breathing ; describe the brainstem centers that control breathing and the inputs they receive from other levels of the nervous system ; explain how pressure gradients account for the flow of air into and out of the lungs, and how those gradients are produced; identify the sources of resistance to airflow and discuss their relevance to respiration* *define partial pressure and discuss its relationship to a gas mixture such as air; contrast the composition of inspired and alveolar air; discuss how partial pressure affects gas transport by the blood;* *describe the mechanisms of transporting O2 and CO2; describe the factors that govern gas exchange in the lungs and systemic capillaries;* *explain how gas exchange is adjusted to the metabolic needs of different tissues; discuss the effect of blood gases and pH on the respiratory rhythmexplain the significance of anatomical dead space to alveolar ventilation; define the clinical measurements of pulmonary volume and capacity; define terms for various deviations from the normal pattern of breathing* *describe the forms and effects of oxygen deficiency and oxygen excess; describe the chronic obstructive pulmonary diseases and their consequences; explain how lung cancer begins, progresses, and exerts its lethal effects*
4	**Urinary System:** - histology of urinary system - Functions of the Urinary System Anatomy of the Kidney - Urine Formation I: Glomerular Filtration - Urine Formation II:Tubular Reabsorption and Secretion - Urine Formation III: Water Conservation - Urine and Renal Function Tests Urine Storage and Elimination	*Development and structural features of the kidney. Renal tubules; reabsorption and secretion; renal endocrine apparatus; urinary tracts, identification of structural elements of the renal cortex, renal medulla, ureter, urinary bladder under the microscope and on the photomicrographs.* *name and locate the organs of the urinary system; list several functions of the kidneys in addition to urine formation; describe the location and general appearance of the kidneys; identify the external and internal features of the kidney; trace the flow of blood through the kidney; trace the flow of fluid through the renal tubules; describe the nerve supply to the kidney.* *describe the process by which the kidney filters the blood plasma, including the relevant cellular structure of the glomerulus; Explain the forces that promote and oppose filtration, and calculate the filtration pressure if given the magnitude of these forces; describe how the nervous system, hormones, and the nephron itself regulate filtration*

		describe how the renal tubules reabsorb useful solutes from the glomerular filtrate and return them to the blood; describe how the tubules secrete solutes from the blood into the tubular fluid; describe how the nephron regulates water excretion. explain how the collecting duct and antidiuretic hormone regulate the volume and concentration of urine; explain how the kidney maintains an osmotic gradient in the renal medulla that enables the collecting duct to function. *identification of structural elements of the ureter, urinary bladder under the microscope and on the photomicrographs.* *explain how the collecting duct and antidiuretic hormone regulate the volume and concentration of urine; explain how the kidney maintains an osmotic gradient in the renal medulla that enables the collecting duct to function; and describe the hormonal mechanism for adjusting the body's rate of water loss to its state of hydration or dehydration*
5	**Lymphatic system and fluid balance**	*List the functions of the lymphatic system;* *Explain how lymph forms and returns to the bloodstream;* *Name the major cells of the lymphatic system and state their functions;* *Describe the structure and function of the red bone marrow, thymus, lymph nodes, tonsils, and spleen* *Name the major fluid compartments and explain how water moves from one to another* *List the body's sources of water and routes of water loss;* *Describe mechanisms of regulating water intake and output;* *List the functions of sodium and potassium;* *Explain how electrolyte balance is regulated;* *Describe three ways the body regulates pH.*
6	**Digestive system and Nutrition**	Describe of the features of blood supply to the liver; Sources of development of the liver and pancreas. Describe the microscopic anatomy of the liver, gallbladder, bile duct system, and pancreas; Clarify the microscopic and ultramicroscopic structure of hepatocytes and their functional significance; List the regions of the digestive tract and the accessory organs of the digestive system; Describe the gross anatomy of the digestive tract from the mouth through the esophagus; Identify the esophagus in the model; Describe the composition and functions of saliva; List the functions and major physiological processes of the digestive system; Distinguish between mechanical and chemical digestion; Identify the basic chemical process that underlies all chemical digestion, name the major substrates and products of this process; Describe the nervous control of salivation and swallowing.

		Describe the gross anatomy of the stomach; Identify the stomach in the model; State the function of each type of epithelial cell in the gastric mucosa; Identify the secretions of the stomach and state their functions; .Explain how the stomach produces hydrochloric acid and pepsin; Describe the contractile responses of the stomach to food; Describe the three phases of gastric function and how gastric activity is activated and inhibited. Describe the gross anatomy of the liver, gallbladder, bile duct system, and pancreas; Identify the liver, gallbladder, bile ducts, and pancreas in the model; Contrast the mucosa of the colon with that of the small intestine; State the physiological significance of intestinal bacteria; discuss the types of contractions that occur in the colon; Explain the neurological control of defecation. Describe some factors that regulate hunger and satiety; Define nutrient and list the six major categories of nutrients; Describe some factors that alter the metabolic rate; identify the principal sources of body heat;
7	**Reproductive system and embriology**	*Define explain why sexual reproduction in humans requires two different types of gametes;* *Enumerate the functions of the male and female reproductive systems;* *Distinguish between the gonads of the two sexes, and between the internal and external genitalia.* *Describe the anatomy of the male reproductive tract.* *Identify the structural elements of the organs of the male reproductive system in histological specimens.* *Explain the features of spermatogenesis, the endocrine function of the testes,* *Determine the tissue composition and layers of the vas deferens and additional organs of the male reproductive system.* *Describe the microscopic anatomy of portion of the male urinary system.* *Identify the structural elements of the organs of the female reproductive system in histological preparations.* *Explain the features of ovogenesis. To master the endocrine functions of the ovaries.* *Explain determine the tissue composition and membrane of the oviduct;* *Define the microscopic anatomy of portion of the female urinary system* *Describe the anatomy of the ovaries;* *Describe the gross anatomy of the female reproductive tract;*

		Relate the process of egg production to the cyclic changes in the ovary and uterus; *Describe the production of eggs and how it is correlated with cyclic changes in the ovaries and uterus;* *Describe the physiological processes that occur in the female during sexual intercourse.* *Identify Sex cells. Early stages of development of the human embryo.* *Define the microscopic anatomy of portion of the embrion.* *Describe a micrograph of the umbilical cord, fetal and maternal parts of the placenta.* *Define and Identify embrions cells.* *Explain the features of spermatogenesis, the endocrine function of the testes, determine the tissue composition and layers of the vas definers and additional organs of the male reproductive system.* *Relate the process of egg production to the cyclic changes in the ovary and uterus.*

List of Anatomical Structures for Examination

2.Endocrine system:

The hypothalamus; thyroid gland (lobes and isthmus); parathyroid gland; the pituitary gland; thymus gland; pineal gland; the adrenal gland; the pancreas; testicles; the ovaries.

3.Respiratory System

Nasal cavity, Hard palate, Nostril, Pharynx, Larynx,Trachea,Pleural cavity,,Pleura (cut) Epiglottis Posterior nasal aperture Soft palate Esophagus Left lung Left main bronchus Lobar bronchus segmental bronchus Diaphragm Alar nasal sulcus Dorsum nasi Nasofacial angle Nasal septum Nasal bone Lateral cartilage Minor alar cartilages Major alar cartilages Dense connective tissue Septal nasal cartilage nose nasal fossae nasal conchae

nasopharynx laryngopharynx oropharynx Frontal sinus Meatuses Tongue Vestibular fold Vocal cord Uvula Medulla oblongata Pons Auditory tube Cribriform plate Vestibule Guard hairs Upper lip Naris (nostril) Perpendicular plate Septal cartilage Vomer Palatine tonsil Lingual tonsil Sphenoid sinus Hyoid bone Thyrohyoid ligamen Thyroid cartilag

Laryngeal prominence Arytenoid cartilage Cricoid cartilage Cricotracheal ligament Cuneiform cartilage Corniculate cartilage Fat pad Tracheal cartilage Glottis Main bronchi Tracheal mucosa Lateral cricoarytenoid muscle Base of tongue Trachealis muscle Hyaline cartilage ring Mucosa Mucous gland Perichondrium Chondrocytes Goblet cell Ciliated cell Mucociliary escalator Apex of lung Superior lobar bronchus Horizontal fissure Middle lobar bronchus

Middle lobe
Inferior lobar bronchus
Oblique fissure
Inferior lobe
Base of lung
Branches of pulmonary artery
Bronchiole
Alveolar sac
Terminal bronchiol
Respiratory bronchiole
Capillary networks around alveoli

Mediastinal surfaces
Costal surface
Cardiac impression
Diaphragmatic surface
Visceral pleura
Great alveolar cell
Alveolar macrophage
Respiratory membrane
Capillary endothelial cell
Squamous alveolar cell
Shared basement membrane

Parietal pleura
Pleural cavity
Alveoli
Bronchial smooth muscle

Pontine respiratory group (PRG)
Dorsal respiratory group (DRG)
Ventral respiratory group (VRG)

4. Urinary system

kidneys
ureters
urinary bladder
urethra
hilum
renal fascia
perirenal fat capsule
fibrous capsule
renal sinus
renal cortex
renal medulla
renal columns
renal pyramids
renal papilla
minor calyx
major calyx
renal pelvis
renal artery
segmental arteries

interlobar arteries
arcuate arteries
cortical radiate arteries
afferent arterioles
nephron
glomerulus
efferent arteriole
peritubular capillaries
cortical radiate veins
arcuate veins
interlobar veins
renal vein
vasa recta
renal corpuscle
glomerular capsule
podocytes
capsular space
renal tubule
proximal convoluted tubule

nephron loop
descending limb
distal convoluted tubule
collecting duct
papillary duct
juxtamedullary nephrons
cortical nephron
renal plexus
juxtaglomerular apparatus
granular cells
mesangia cells
macula densa
principal cells
Intercalated cells
detrusor
external urethral orifice
urethral glands
internal urethral sphincter.

5. Lymphatic system:

lymphatic organs primary and secondary, Thymus, lymphatic nodes, spleen, bone marrow, lymphatic vessels, lymphatic trunks, lymphatic ducts.

6.Digestive system:

The vestibule of the oral cavity; The oral cavity itself; Upper / lower lip; Adhesions of the lips; Frenulum of the upper / lower lip; cheek; the fatty body of the cheek; gums; the bridle of the tongue; hyoid fold; the hyoid papilla; hard and soft palate; palatine tongue; amygdala fossa; palatine tonsil; pharynx; the muscle of the tongue; palatine-lingual muscle; crown, neck; incisors; the tongue and its parts; lingual tonsil; tongue papillae: filiform, conical, mushroom-shaped, grooved, leaf-shaped; the lingual muscle; styloid muscle; the parotid gland; submandibular gland; the hyoid gland; small sublingual ducts; pharynx; the arch of the pharynx; the nasal, oral, and laryngeal parts of the pharynx; pharyngeal (adenoid) tonsil; pharyngeal opening of the auditory tube; esophagus; cervical, thoracic, abdominal parts of the esophagus; the stomach; front / rear walls; small / large curvature; cardiac hole and cardiac part; the arch and body of the stomach; pyloric part; the gatekeeper's hole and flap; the pyloric sphincter; folds of the stomach; gastric fields; the hepatic-gastric ligament; the small intestine and its departments: duodenum, skinny, ileal; circular folds; intestinal villi; intestinal glands; group lymphoid nodules; an ampoule (bulb) of the duodenum; the upper, descending, horizontal, ascending parts of the duodenum; the colon and its parts: cecum, ascending / transverse / descending / sigmoid colon; rectum; ribbons of the colon: mesenteric, omentum, free; colon gaustra; omental processes; ileocecal valve; vermiform appendix; the right / left bend of the colon; semilunar folds of the colon; the sacral / perineal bend

of the rectum; an ampoule of the rectum; the anal (anal) channel; anus; the internal / external sphincter of the anus; transverse folds of the rectum; anal (anal) pillars, sinuses, flaps; rectal venous plexus; the liver, its surface: diaphragmatic / visceral; the lower edge; ligaments of the liver: crescent, coronoid, right and left triangular, hepatic-gastric, hepatoduodenal, round; the right / left lobe of the liver; the fossa of the gallbladder; tenderloin, fissure of the round ligament; venous ligament fissure; the groove of the inferior vena cava; the gate of the liver; own hepatic artery; portal vein; square fraction; caudate lobe; a lobule of the liver; interlobular arteries, veins; central veins; bile ducts; interlobular ducts; right / left / common hepatic duct; gall bladder; the bottom, body, neck of the gallbladder; cystic duct; spiral fold; common bile duct; hepatic-pancreatic ampoule; the pancreas, its parts: head, body, tail; pancreatic tenderloin; front / back / bottom surface; upper / front / lower edge; pancreatic duct; accessory duct of the pancreas; spleen: diaphragmatic / visceral surface, upper / lower edge, anterior / posterior end; the gates of the spleen;

7. Reproductive system:
The surfaces, ends and edges of the testicle; the protein coat and the mediastinum; tubules and ducts of the testis; the epididymis and its parts; the sinus of the appendage; the vas deferens and its parts; spermatic cord and its parts; the shell of the testis and spermatic cord; the weight of the testis and epididymis; the prostate gland; seminal vesicles; vas deferens; bulbourethral glands; the cavernous and spongy bodies of the penis; the foreskin of the penis; bridle of the foreskin; parts of the urethra, its bends and sphincters; scrotum. the ends, edges and surfaces of the ovary; own and suspensory ligaments of the ovary; fallopian tube; fringe pipes; the uterine part, the isthmus, ampoule and funnel of the fallopian tube; the mesentery of the tube; the body, bottom and cervix; the opening of the uterus; lip front and rear; cervical canal, uterine cavity; round and wide ligaments of the uterus; the vagina; the vaginal vault; the vestibule of the vagina; the female urethra; onion vestibule; large and small labia; the clitoris; glands of the vestibule; superficial / deep transverse muscle of the perineum; the sphincter of the urethra; sciatic-cavernous muscle; the sphincter of the anus; muscle lifting the anus; perineal fascia; sciatic-rectal fossa.

List of histological slides:

1. Spermatozoa. Hematoxylin. x 1000.
2. Oocytes of mammal. Hematoxylin – eosin. x 630.
3. Maternal part of the placenta. Hematoxylin – eosin. x 100.
4. Umbilical cord of pig. Hematoxylin – eosin. x 40.
5. Fetal part of the placenta. Hematoxylin – eosin. x 400.
6. Ependymal glia of the spinal cord. Azocarmine. x 400.
7. Myelinated nerve fibre. Osmium impregnation. x 200.
8. Cornea. Hematoxylin – eosin. x 100.
9. Posterior wall of the eye. Retina in the dark. Hematoxylin – eosin. x 200.
10. Spiral organ (organ of Corti). Hematoxylin – eosin. x 400.
11. Spinal ganglion. Hematoxylin – eosin. x 400.
12. Transverse section of the spinal cord. Silver impregnation. x 40.
13. Cerebral (brain) cortex . Silver impregnation. x 200.
14. Cerebellum. Silver impregnation. x 200.
15. Spleen. Hematoxylin – eosin. x 200.
16. Thymus. Hematoxylin – eosin. x 100.
17. Hypophysis of cat. Hematoxylin – eosin. x 200.
18. Adrenal (suprarenal) gland. Zonae glomerulosa and fasciculata. Azocarmine. x 200.
19. Thyroid gland. Hematoxylin – eosin. x 400.

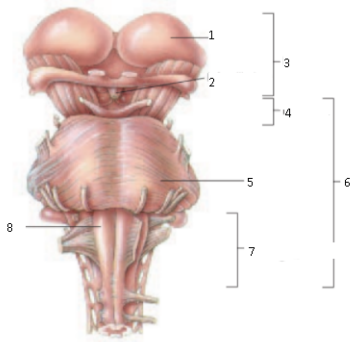
20. Parotid gland. Hematoxylin – eosin. x 630.
21. Esophagus. Hematoxylin – eosin. x 100.
22. Stomach. Fundus (region of neck and body of glands). Congo-Roth. x 200.
23. Duodenum. Hematoxylin – eosin. x 100.
24. Human liver. Hematoxylin – eosin. x 100.
25. Uterus. Endometrium. Hematoxylin – eosin. x 200.
26. Mammary glands of cow. Hematoxylin – eosin. x 100.
27. Oviduct. Azocarmine. x 40.
28. Ovary of cat. Cortex . Hematoxylin – eosin. x 100.
29. Prostate gland. Hematoxylin – eosin. x 100.
30. Testis. Hematoxylin – eosin. x 200.

Sample typology of exam assignments

Example of physiology assignment:

Jake is 74 years old, he has hypertension and a quick temper. A few days ago he suffered a stroke and hemorrhage in the temporal lobe. What can be the consequences depending on the functions of this lobe? Describe the differences between Wernicke's and Broca's areas depending on their function.

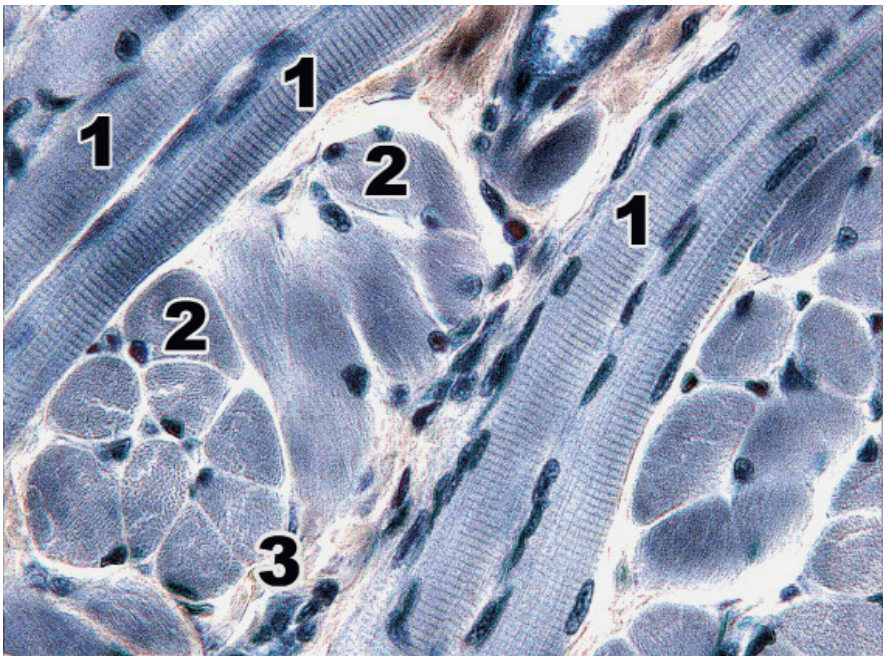
Example of anatomy assignment:



Indicate which view is shown on the picture. Identify which part of the CNS is shown. Explain its embryonic development. Name each anatomical structure that is marked in the picture and describe its function. Describe which tracts pass through these structures.

Sample assignment for histology

Striated skeletal muscular tissue of tongue. Iron hematoxylin. x 630.
Identify the structures of the skeletal muscular tissue indicated by the numbers. Describe the structure of the muscle fiber. Explain the features of the regeneration of striated muscle tissue.



Example of an OSPE stations
At each station it is necessary to fill in the gaps in accordance with the table.
Determine the structure of the body proposed to you and write them in Russian and Latin

Station Stomach

№	Latin name	English name
b		
	Fundus of the stomach	
2		
3		
	pyloris	

2 станция Pancreas

№	Latin name	English name
15		
18		
16		
		Tail of pancreas
	caput pancreatis	

Station 8 - HISTOLOGY

Identify the tissue that you can now see under the magnification of the microscope. Then find a microphotograph of this tissue and describe it using the form below.

Description of microphotography

Name of the tissue under the microscope	
Individual structural elements (Research objects)	**1.** **2.** **3.** **4.** **5.**
Structural features of this tissue	
Function	

Response quality scale (written / oral response)

Mark	Criteria	Scale, points
Excellent	1. all key aspects are included and presented logically; 2. high accuracy (relevance, without redundancy) and constant attention to the issue; 3. excellent integration of theoretical questions; 4. providing relevant examples; 5. in-depth analysis and theoretical justification of the problem (if applicable), all key aspects identified and interpreted; 6. fluency in professional terminology	90 - 100
Good	1. all key aspects are included and presented logically; 2. constant focus on the issue with satisfactory accuracy, relevance, and / or some redundancy; 3. satisfactory integration of theoretical questions; 4. the lack of examples; 5. satisfactory analysis and theoretical justification of the problem (if applicable), most of the key aspects identified and interpreted; 6. correct use of professional terminology	70 - 89
Satisfactory	1. most of the key aspects are included; 2. satisfactory focus on the question - some errors and / or noticeable redundancy; 3. theoretical problems presented without noticeable integration; 4. Providing failed examples or no examples; 5. some analysis and theoretical justification of this problem (if applicable), most of the key aspects are defined and interpreted; 6. correct use of professional terminology	50 - 69

Unsatisfactory (FX)	1. most of the key aspects are omitted; 2. lack of attention to the issue-irrelevant and significant redundancy; 3. some theoretical problems presented without integration and understanding; 4. missing or outdated examples; 5. some analysis and theoretical justification of this problem (if applicable), most of the key aspects are omitted; 6. problems in using professional terminology	25 - 49
Unsatisfactory (F)	1. most or all of the key aspects are omitted; 2. no focus on the question, not much related to the issue of information; 3. significant gaps in theoretical questions, or their superficial consideration; 4. the lack of examples or irrelevant examples; 5. there is no analysis and no theoretical justification for the given problem (if applicable), most of the key aspects are omitted; 6. problems in using professional terminology	0-24

Grading system

Rating by letter system	**Digital equivalent of points**	**Percentage**	**Evaluation using the traditional system**
A	4	95-100	Excellent
A-	3,67	90-94	
B+	3,33	85-89	Good
B	3	80-84	
B-	2,67	75-79	
C+	2,33	70-74	
C	2	65-69	Satisfactory
C-	1,67	60-64	
D+	1,33	55-59	
D-	1	50-54	
FX	0	25-49	Unsatisfactory
F	0	0-24	
I (Incomplete)	-	-	«Discipline is not completed» (it is not taken into account when calculating the GPA)

Basic literature:

1. Saladin, Kenneth S: Anatomy & Physiology. The Unity of Form and Function, 9th Edition (2020, McGraw-Hill Education), ISBN-10 1260571297, 978-1260571295
2. Costanzo, Linda S.: BRS Physiology. Board Review Series.7 edition. -Wolters Kluwer Health, 2018.- 307p. - ISBN 1496367693, 9781496367693
3. Leslie P. Gartner: Color Atlas and Text of Histology. - 7th Edition. - Wolters Kluwer, 2017. ISBN 1496346734, 9781496346735
4. Russell K. Hobbie, Bradley J. Roth: Intermediate Physics for Medicine and Biology. - Springer, 2015. - ISBN 3319126822, 9783319126821
5. Andersson D, Medical Terminology: The Best and Most Effective Way to Memorize, Pronounce and Understand Medical Terms: Second Edition, ISBN-13 : 978-1519066626, 2016
6. Shoibekova, Alima Zhorabaevna. Latin and Fundamentals of Medical Terminology for Medical Students with Training English [Text] : educational man. / A. Zh. Shoibekova, 2016. - 163, [1] p.
7. Sembulingam, K. Essentials of Medical Physiology [Text] : [monogr.] / K. Sembulingam, P. Sembulingam ; Madha Medical College [et al.]. - 7th ed. - New Delhi ; London ; Philadelphia : Jaypee, 2016. - 1112 p. : il. - Ind.: p. 1069-1112. - ISBN 978-93-85999-11-6

Additional literature:

0. Standring, Susan: Gray's Anatomy: The Anatomical Basis of Clinical Practice. - 41 Elsevier Limited, 2016

0. Elaine N. Marieb, Lori A. Smith: Human Anatomy & Physiology Laboratory Manual, Main Version. - 11 edition. - Pearson Education,2015. - ISBN 9780133999143

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