QUESTIONS
for preparing to normal (human) physiology examination

Chapter 1. Common physiology.

Introduction to physiology.

1. The subject matter of physiology. Connections between physiology and other sciences and role of physiology for theory and practice of medicine. Methods of physiology. Acute and chronic experiments.
2. The main stages of physiology development.
3. The analytical and systemic approaches to the study of physiological functions. Conception about systemic function organization.
4. I.P. Pavlov and I.M. Sechenov role in the development of the physiology foundations.
5. Physiological functions. The main functions of the cells, tissues and organs.
6. Forms of physiological functions regulations (humoral, hormonal, nervous regulation).
7. Regulation according to the reflex principle (R. Descartes (Cartesius), J. Prochazka) and it development in I.P. Pavlov and I.M. Sechenov works. The main principles of the reflex theory.
8. Theory of the functional systems by P.K. Anochin. Main mechanism of the functional systems.
9. Biological rhythms and their role.
10. Stress, definition, types of stress. The main stress stages and their characteristic.
11. Mechanism of stress reaction development. Stress-realizing and stress-limiting systems. Consequences of stress reaction.
12. Organism adaptation. Relation between stress reaction and adaptation process.
13. Adaptation phases. Types of adaptation.
14. Mechanism of adaptation. The role of nervous, humoral and endocrine factors. Systemic structural result of adaptation.

Excitable tissues physiology.

1. Common properties of excitable tissues.
2. Modern conception about biological membranes structure and functions. Active and passive transport of different substances across membranes. Ion channels, ion pumps and their mechanism of action. Ion gradients and their role in originating of cell electrical potentials.
3. Electrical phenomenons in excitable tissues. History of their discovery.
4. Resting membrane potential (RMP) and it origin. Mechanisms of Resting membrane potential maintaining (selective membrane permeability, Na^+/K^+ pump etc.).
5. Action potential (AP) and it phases. Modern conception about mechanism and phases of action potential.

6. Local response (LR) and the action potential, their properties, phases and ionic mechanisms.
7. A ratio of the excitability periods with action potential phases.
8. The lows of excitable tissues reaction on irritation (low of force, duration, "all or nothing" etc.).
9. Action of direct electrical current on excitable tissues.
10. Structure and function organization of skeletal fiber. Physiological properties of a skeletal muscle.
11. The relation between excitation, contraction and relaxation of skeletal muscle (electro-mechanical relation).
12. The relation between excitation, contraction and relaxation curves of skeletal muscle.
13. Types of muscle contraction. The single muscle contraction and it phases. The relation between the amplitude of skeletal muscle contraction and the strength of the stimulant. Tetanus, its types. Optimum and pessimum of contraction by N.E. Vvedensky.
14. Muscle fibers types. Motor units, types and functional features. Peculiarities of motor units in different type of muscles. The role of motor units in regulation the strength of muscle contraction.
15. Strength and labor of muscle. The optional load and the rhythm of contraction. Low of average load.
16. Functional characteristic of smooth muscles.
17. Lability. The phases and mechanisms of the parabiosis by N.E. Vvedensky.
18. Mechanisms of conducting excitations along nerve fibers. Excitability and lability of nerve fibers.
19. Modern conception about excitation and excitability. Estimation of excitability. dependence between threshold irritation and irritation duration. Chronaximetry
20. Forth – time curve or irritation. Reobase, chronaxy and their significance in medicine.
21. Common physiological characteristic of junctions. Junction classification. Functional properties of chemical junction. Structure-functional organization of neuromuscular junction.

Common Physiology of the Central Nervous System

1. Neuron as a structural and functional unit of the CNS. Functional properties of neurons. Connections between neurons and glial cells. Association of neurons in neuronal net. Neural pathways.
2. Peculiarities of excitation conduction in CNS synapses. Excitatory and inhibitory synapses and their mediator mechanisms.
3. The main principles and peculiarities of excitation propagation in CNS (divergence, convergence, reverberation, facilitation etc.).
4. Inhibition in CNS (I.M. Sechenov), it types and role. Contemporary conception about mechanism of central inhibition.

5. The main principles of coordination CNS activity. Dominant and it role (A.A. Uchtomski).
6. Reflex arch and reflex loop. Feedback connection and it role. Multilevel reflex organization (E.A. Asratian).
7. Nervous center. Physiological conception of nervous center in broad and narrow meaning. Functions of nervous centers and their properties (spatial and temporal summation, excitation rhythm transformation, plasticity, nervous centers exhaustion).

Endocrine Physiology

1. General hormones characteristic and classification.
2. Regulation of hormone secretion. Interaction between endocrine glands and nervous system.
3. Hormone formation and secretion, their transport by blood. Autoregulation of endocrine system.
4. Mechanism of hormone action, primarily and secondary messengers conception.
5. Anterior pituitary gland (adenohypophysis) hormones, it functional connections with hypothalamus and participation in endocrine organs regulation.
6. Thyroid gland physiology and it role in the organism.
7. Posterior pituitary gland (neurohypophysis) hormones, their role and mechanism of action.
8. Endocrine role of pancreas and it role in metabolism.
9. Fuctional system which maintain optimal blood glucose level.
10. Pineal gland and thymus gland physiology.
11. Adrenal gland physiology. Adrenal cortex hormones role in organism functions regulation.
12. Adrenal medulla hormones role in organism functions regulation.
13. Gonads (ovaries and testes). Male and female sexual hormones and their physiological role. Placenta endocrine function.
14. Parathyroid gland. Hormonal regulation of calcium metabolism in the organism.
15. Hypothalamus-hypophysis-adrenal axis and it role in stress and adaptation.
16. Idea about regulatory peptides.
17. Prostaglandins and their role in the organism.

Chapter 2. Special physiology fields.

Body fluids

1. Body fluids (blood, lymph, interstitial fluid, intracellular fluid, cerebrospinal fluid etc.) and their distribution in the organism.
2. Stability of the chemical composition and physico-chemical properties of the 7internal environment. Homeostasis.
3. Blood. Properties and functions of the blood. Idea about blood system.

4. Composition of blood. Hematocrit ratio. Physiological constants of blood (strict and labile constants) and mechanism of their regulation.
5. Plasma and it composition. Serum. Plasma electrolytes. Blood osmotic pressure, it regulation and role in water exchange between blood and tissues. Functional system which provide constant blood osmotic pressure.
6. Plasma proteins, their characteristic and functional meaning. Plasma oncotic pressure and it role.
7. Acid-base balance of blood. Physical, chemical and physiological mechanisms which maintain constant blood pH. Acidosis and alkalosis. Functional system which provide constant blood acid-base balance.
8. Formed Elements of the Blood. Erythrocytes (red blood cells), their function and peculiarities. Haemolysis and it types. Rheological properties of blood. Aggregation and deformability of erythrocytes.
9. Erythrocyte sedimentation rate (ESR) and factors which effect it.
10. Quantity of erythrocytes in the blood and methods of their count.
11. Hemoglobin, it characteristics and functions. Mean corpuscular hemoglobin.
12. Hemoglobin types and hemoglobin compounds, their physiological meaning.
13. Leukocytes (white blood cells), types of leukocytes, quantity, methods of count. Properties and functions of leukocytes.
14. Leukocyte formula. Leucocytosis and leucopenia.
15. Essential physiological principles of immune response, T- and B-lymphocytes. Apoptosis.
16. Phenomenon of cell adhesion, mechanisms of intercellular interactions (integrins, selectins).
17. Thrombocytes (platelets) and their functions.
18. Main parameters of general blood analysis. Hemogram. Physiological estimation of blood analysis results. Diagnostic meaning of general blood analysis.
19. Erythron and leukon. Humoral and nervous regulation of erythro- and leukopoiesis.
20. Idea about hemostasis system. Initial (vascular-thrombocyte) and secondary (coagulation) hemostasis, their meaning.
21. Contemprary conception about main factors, which participate in blood coagulation. Stages of blood coagulation.
22. Role of vascular wall in hemostasis system. Fibrinolysis. Anticoagulant factors.
23. Blood group systems ABO, Rh. Basic principles of donor blood selection. Risk factors for the recipient.
24. Basic roles of blood transfusion and transfusion of blood components. Transfusion solutions and requirements, which this solutions must fulfill. Classification of blood transfusion solutions according to their functions in organism.

25. Interstitial fluid, cerebrospinal fluid, lymph, their composition, quantity, functional meaning. Fluid exchange between blood capillaries and interstitial space (Starling theory). Blood depots and their functional meaning.

Heart and circulation physiology

1. Overview of the circulation. Functions of the circulation and their meaning for organism functioning. Circulation as a component of different functional systems.
2. Physiological properties and peculiarities of heart muscle. Contemprary conception about substratum, mechanism and gradient of heart automacity (self-excitation rhythmicity).
3. Action potential of typical cardiomyocyte (contracting heart muscle) and atypical cardiomyocyte (cells of specialized excitatory and conductive system of the heart).
4. Correlation between excitation, contractility and excitability of the heart in different phases of cardiac cycle. Reaction of heart muscle on additional stimulation. The extrasystole and it types.
5. The cardiac cycle and it phase structure. Sequence of phases and periods of cardiac cycle.
6. The heart as a pump. Changes in pressure and blood volume in heart chambers in different phases of cardiac cycle.
7. Systolic volume and cardiac output in rest and during physical exercises. Methods of their determination.
8. Electrocardiogram (ECG). Formation of ECG components. ECG leads. Characteristics of the normal ECG. Role of ECG interpretation in medicine.
9. Dipole theory of ECG. Heart muscular fiber as a dipole (depolarization and repolarization dipoles). Propagation of excitation wave through myocardium.
10. Phonocardiography. Heart sounds and their origin.
11. Levels of heart pumping regulation, and their characteristic.
12. Intrinsic regulation of heart pumping. Geterometric and gomeometric regulation (Frank-Starling, Anrep).
13. Humoral control of heart activity and of heart pumping.
14. Control of heart by the sympathetic and parasympathetic nerveas and their mediators. Heart reflexes. Main reflexogenic zones and their meaning.
15. Exsteroceptive and interoceptive heart reflexes.
16. The main hemodynamics laws and their utilization for explanation of circulation.
17. Functional structure of blood vessels. Functional and morphological classification of blood vessels.
18. Factors, which provide blood flow through vessels. Aortic compressive chamber. Role of elasticity of vessel wall.

19. Velocity of volume and linear blood flow in different vascular zones and factors which regulate it.
20. Arterial and venous pulse and their origin. Sphygmogram and flebogram analysis.
21. Vascular tone and it types.
22. Humoral control of vascular tone. Role of the endothelium (hormones, renin-angiotenzin-aldosteronic system, kinins, prostaglandins, nitric oxide, endotelins, methabolits, O_2, CO_2).
23. Nervous and reflectory control of vascular tone. Vasomotor center and it efferent effects. Afferent stimulation of vasomotor center.
24. Blood pressure and it types. Blood pressure in different vascular zones. Factors, which determine arterial and venous blood pressure.
25. Blood pressure as one of physiological constants of the organism. Analysis of central and peripheral components of the functional system of blood pressure regulation.
26. Capillary fluid exchange and it peculiarities. Microcirculation and it role in fluid exchange between blood and tissues.
27. Morphological and functional characteristics of microcirculation main components. Conception about tissue functional element (A.M. Chernuch).
28. Lymphatic system. Mechanism of lymph formation and lymph flow. Functions of the lymph.
29. Functional peculiarities of structure, functions and regulation of circulation in some organs. Peculiarities of brain, coronary and lung circulation.

Respiratory physiology

1. Respiration and it main stages. Respiratory and nonrespiratory lung functions.
2. Lung ventilation apparatus. Respiratory cycle. Inspiration and expiration mechanisms.
3. Airways physiology. Airways diameter regulation.
4. Inrapleural space pressure, it origin and role. Inrapleural space pressure changes in different respiratory cycle stages. Elastic properties of lungs and chest. Surfactant role.
5. Respiration disturbance during pneumotorax. Dangerous of chest penetrating wounds.
6. Respiratory resistance and it types. Work of respiration.
7. Convection and diffusion role in maintenance of relatively constant composition of alveolar air. Dead space conception.
8. Respiratory volumes and capacities, lung ventilation parameters. Spirometry, spirography, pneumotachometry.
9. Lung ventilation-perfusion relationships. Alveolar hypoxic vasoconstriction.

10. Gas exchange in the lung. Gaseous composition of atmosphere, inspiratory and exspiratory airs. Partial gas pressure (O_2, CO_2) in alveolar air and gas tensions in arterial and venous blood.
11. Lung diffusion capacities. Fick equation for gas diffusion estimation. Factors which effect gas diffusion between alveolar air and blood.
12. Blood gas transport. Oxyhemoglobin dissociation curve and it characteristics.
13. Hemoglobin oxygen affinity and factors which determine it.
14. Blood oxygenation in the lung and factors which determine it. Degree and capacity of arterial and venous blood oxygenation. Blood oxygen capacity.
15. Conception about system and regional oxygen capacity. Oxygen utilization coefficient in rest condition and during physical exercises.
16. Intraerythrocyte system of hemoglobin oxygen affinity regulation.
17. Tissue gas exchange. Tension of O_2 and CO_2 in interstitial fluid and cells. Factors which determine blood deoxygenation in tissues. Myoglobin significance.
18. Carbon dioxide blood transport. Carboangidrase significance.
19. Indices of O_2 and CO_2 tension and concentration in arterial and venous blood. Oxygen and carbon dioxide blood transport conjunction.
20. Respiratory center. Contemporary conception about it structure and localization. Respiratory center automacity.
21. Reflectory breathing autoregulation. Mechanism of respiratory phases changes. Airway, lung and respiratory muscles receptors. Gering-Breyer reflexes.
22. Regulatory effects on respiratory center from higher brain structures (hypothalamus, limbic system, large cerebral hemispheres).
23. Humoral regulation of respiration. Central and peripheral chemoreceptors. Carbonic acid significance.
24. Functional system providing blood gas content constancy. Analysis of it peripheral and central components.
25. Conception about blood gas transport system. It functional goal and positive adaptive results. Organism functional reserves in gas exchange.
26. High altitude and underwater respiration (increased and decreased barometric pressure) and respiration at environmental air gas composition changes.

Gastrointestinal Physiology

1. Digestion, it functional meaning. Gastrointestinal tract functions. Digestion types depending from origin and localization of enzymes.
2. I.P. Pavlov as a founder of contemporary gastrointestinal physiology.
3. Experimental and clinical methods of gastrointestinal tract investigation.
4. Feeding centre. Feeding motivation. Physiological basis of hunger and satiety.

5. Functional system providing nutrient constancy in the blood. Analysis of it central and peripheral parts.
6. Gastrointestinal conveyor, their functions (secretion, motility, absorption).
7. Principles of gastrointestinal system regulation. Role of reflex, humoral and local mechanisms of regulation.
8. Endocrine function of gastrointestinal tract.
9. Digestion in the oral cavity. Mechanical and chemical food processing.
10. Saliva composition and physiological role. Salivation and it regulation.
11. Digestion in the stomach. Composition and properties of gastric juice. Gastric secretion regulation. Gastric secretion phases.
12. Peculiarities of gastric secretion during proteins, lipids and carbohydrates digestion. Gastric secretion adaptation to different food types and diets. Motility and food evacuation from the stomach.
13. Digestion in duodenum. Exocrine function of pancreas. Pancreas secretion regulation and adaptive character.
14. Composition and properties of pancreatic gland juice.
15. Role of the liver in digestion. Regulation of bile formation and secretion in duodenum.
16. Composition and properties of intestine juice. Regulation of intestine juice secretion.
17. Nutrients hydrolysis in the gastrointestinal tract lumen and membrane hydrolysis in different small intestine parts. Motility of small intestine and it regulation.
18. Peculiarities of digestion in the large intestine. Large intestine microflora role in the organism. Motility of large intestine. Ballast substances role.
19. Absorption in different parts of gastrointestinal tract. Types and mechanisms of substances absorption through biological membranes.

Energy and substance metabolism. Nutrition.

1. Metabolism in organism. Primarily and secondary heat. Assimilation and dissimilation. Plastic and energetic role of nutrients.
2. Direct and indirect calorimetry (energy metabolism investigation through complete and incomplete gas analysis). Respiratory quotient. Oxygen calorie equivalent.
3. Basal metabolism, it value and factors which determine it. Energy loss in basal metabolism conditions. Basal metabolism determination role.
4. Balance of energy in organism. Working supplement. Energy loses during different type of working activity. Specific dynamic action of nutrients.
5. Nitrogen balance, nitrogen equilibrium, nitrogen minimum and optimum.
6. Physiologic basis of nutrition. Conception of adequate and rational nutrition. Classification of food components.

7. Protein requirements depending from age, working activity type and organism condition (pregnancy, lactation etc.). Daily carbohydrate and fat requirement.
8. Mineral substances, microelements and vitamins significance in organism. Autoregulation of water and mineral balance.
9. Energy loss and nutrient requirements data utilization for food allowance composition.
10. Contemporary approach to problem of different food allowance and diet types.

Temperature regulation physiology

1. Constant temperature of inner environment as necessary condition for normal metabolism process. Poikilo-, homoio- and heterotermal conditions.
2. Temperature of human organism and it daily fluctuations. Termometry. Temperature of different skin surface portions and inner organs.
3. Chemical termoregulation. Metabolism as a source of heat formation. Contractile and non-contractile termogenesis. Different inner organs role in heat formation.
4. Physical termoregulation. Heat exchange types (radiation, heat conduction, convection, evaporation).
5. Physiological mechanisms of temperature exchange (blood flow in skin vessels, sweating etc.). Behavioral termoregulation.
6. Heat balance. Heat balance equation.
7. Peripheral and central termoregulation mechanisms. Functional system providing constant temperature of inner body environment.

Excretion Physiology

1. Excretion is as an important part of functional systems providing constancy of internal environment. Excretion organs and their participation in main internal environment parameters maintain.
2. Kidney role in acid-base balance, osmotic pressure, blood ion content, blood volume maintain, in blood pressure, blood cell formation, water-ion balance regulation. Incretion function of the kidney.
3. Peculiarities of kidney blood supply. Auotoregulation of blood circulation in the kidney (Baylis-Ostroumov phenomenon).
4. The main mechanisms of urine formation: glomerular filtration, tubular reabsorption and secretion.
5. Primary urine formation, it volume and composition.
6. Terminal urine formation, it composition and properties. Reabsorption of different substances in nephron tubules and loop pf Henle. Secretion and excretion processes in nephron tubules.
7. Countercurrent-multiplying renal system.
8. Neurohumoral regulation of urin formation.
9. Excretion function of skin, lungs and gastrointestinal tract.
10. Regulation of urine secretion and urination.

Particular Physiology of the Central Nervous System

1. Spinal cord, it structural and functional organization. Main functions of the spinal cord. Spinal cord reflexes classification.
2. Spinal cord mechanisms of muscle tone and muscle movement regulation.
3. Spinal shock, it mechanisms and it manifestations in different animal types. Spinal cord place in systemic hierarchy of CNS.
4. Medulla oblongata and pons, their structural and functional organization and main functions. Medulla oblongata and pons reflexes classification.
5. Mesencephalon (midbrain), it structural and functional organization. Main functions of the midbrain. The types of midbrain reflexes.
6. Decerebrate rigidity and mechanisms of it development. Midbrain and medulla oblongata role in regulation of skeletal muscle tone.
7. Tonic reflexes of the brain stem. Static and stato-kinetic reflexes (R. Magnus). Autoregulation mechanisms of body equilibrium maintenance.
8. Cerebellum, it structural and functional organization. Consequences of the cerebellum removal.
9. Reticular formation of the brain stem. Upward and downward facilitatory and inhibitory effects of reticular formation. Participation of reticular formation in integral activity of the organism.
10. Thalamus, medial and lateral geniculate bodies. Functional characteristic of thalamic nuclear groups.
11. Hypothalamus. Characteristic of main hypothalamic nuclear groups. Participation of the hypothalamus in vegetative (autonomic) function regulation, emotion and motivation formation.
12. The autonomic (vegetative) nervous system. Distinctive features of somatic and autonomic nervous system divisions.
13. Physiology of the sympathetic and parasympathetic divisions of autonomic nervous system. Comparative description of the sympathetic and parasympathetic nervous systems, synergism and relative antagonism of their effects.
14. Adaptation and trophic function of the autonomic (vegetative) nervous system. Participation of autonomic (vegetative) nervous system in integral behavior acts. Vegetative supply of somatic functions.
15. Limbic system, peculiarities of it structural and functional organization. Main functions of the limbic system.
16. Basal ganglia (striatopallidal system) and their structural and functional organization. Main functions of the basal ganglia.
17. Role of the hypothalamus, limbic system, reticular formation and cerebral cortex in vegetative functions regulation.
18. Structural and functional organization and contemporary conception about functions localization in cerebral cortex.

Sensory System Physiology

1. I.P. Pavlov conception about analyzer systems. Physiological role of different analyzer system portions. Sensory systems and sensory organs conception.
2. Receptory portion of the sensory system. Receptors classification and functional properties. The mechanism of excitation development in the primary and secondary sensory receptors. Receptor and generator potentials.
3. Conductory portion of the sensory system. Specific and nonspecific afferent systems. Subcortical structures participation in conduction and analysis of afferent stimuli.
4. Cortical portion of the sensory system (I.P. Pavlov). The process of afferent excitations synthesis in the cortex. Sensory systems interaction.
5. Sensory systems adaptation, its peripheral and central mechanisms. Receptors classification according to the adaptation process velocity.
6. Visual sensory system description. Receptory apparatus. Photochemical processes in the retina in response to the light.
7. Theories of color vision (perception) (M. Lomonosof, H. Helmholtz etc.). The main forms of the color vision disturbance.
8. Physiological mechanisms of the accommodation processes of the eye. The visual sesnsory system adaptation, its mechanisms. The efferent stimuli role. The vision field and visual acuity.
9. Conductory portion of the visual sensory system. Peculiarities of optic chiasm.
10. Cortical portion of the visual sensory system. The optic image formation. The right and left cortical hemispheres role in visual perception.
11. Auditory sensory system. Sound-receptive and sound-conducting apparatus. Receptory portion of the auditory sensory system. Mechanism of receptor potential generation in hair cells of the organ of Corti.
12. Peculiarities of the conductory portion of the auditory sensory system. The theories of sound recognition (resonator theory by H. Helmholtz, traveling wave theory by Bekesi etc.).
13. The vestibular sensory system role in perception and estimation of body movements and body orientation with respect to gravity.
14. Tactile sensation and it role.
15. Thermal sensation role in perception of the temperature of the inner and external environment of the body. Functional peculiarities of different thermal sensory system portions, their role in temperature homeostasis.
16. Olfactory sensory system physiological characteristic.
17. Gustatory sensory system physiological characteristic.
18. Interoreceptor sensory system role in maintaining of the constant composition of the internal body environment. The interoreceptors classification and peculiarities of their functioning.
19. The biological role of the pain. The pain theories. Nociceptors, their classification, peculiarities of pain perception and transmission. The

cortical and subcortical structures and humoral factors role in the pain reactions formation.

20. Antinociceptive system. The neurochemical mechanisms of antinociception.
21. Opioid receptors and their ligands. The physiological basis of anesthetization and narcosis.

Higher Nervous System Physiology

1. Higher central nervous system activity definition. The I.M. Sechenov and I.P. Pavlov role in conception of the higher central nervous system functions creation.
2. Inborn types of behavior (unconditioned reflexes and instincts), their role in adaptation forming activity.
3. Conditioned reflex as a form of animals and human adaptation to changing living conditions. Regularity of conditioned reflexes formation and manifestation. Conditioned reflexes classification.
4. Structural and functional basis of conditioned reflexes. Temporal connection, the mechanism of it formation.
5. The inhibition phenomenon in the higher central nervous system activity. Inhibition types. Contemporary conception about inhibition mechanisms.
6. The force relation law and it disturbances in nigher central nervous system activity.
7. Analytical and synthetic activity of the brain cortex large hemispheres. Conditioned reflex switching. Dynamic stereotype, it physiological principles and role in learning and labour skills development.
8. The structure of entire behavior act from the point of functional systems theory by P.K. Anochin.
9. The physiological mechanisms of excitation and inhibition processes propagation through the brain cortex large hemispheres during conditioned reflexes formation (irradiation, concentration, induction).
10. Requirements, motivations, their classification, mechanism of development, role of CNS portions and humoral factors.
11. Emotions, their classification and biological role. Theories of emotions formation. Structural and functional basis of emotions.
12. The objective emotions signs. Emotional stress as a risk factor in psychosomatic pathology development.
13. Memory, it biological role. Classification of memory stages and types. The mechanisms of short-term and long-term memory. Age related memory changes.
14. Awakefullness and sleep. The sleep stages and types. The physiological functions during slow wave and rapid wave sleep. The physiological mechanism of sleep process. The slow wave and rapid wave sleep biological role. Age related sleep changes.
15. The I.P. Pavlov conception about 1 and 2 signal systems. Structural and functional basis of the 2 signal system, speech.

16. The I.P. Pavlov conception about higher central nervous system activity types in animals and humans, their classification, description and methods of determining.
17. The functional asymmetry of the brain cortex large hemispheres
18. The methods of higher central nervous system activity investigation. The conditioned reflex method and it role.

The profile normal physiology questions for international faculty students

1. The adult man life periods. Idea about the ageing processes.
2. Age related changes in the heart activity.
3. Age related changes in the hemodynamics.
4. Blood pressure in people of different ages.
5. The physiological predisposals of blood pressure disturbances and theoretical approaches for their correction. The risk factors.
6. The physiological predisposals of heart blood supply disturbance – ischemic heart disease and heart attack.
7. The emotions role in cardiovascular diseases development.
8. Age related changes in lung ventilation and gas exchange.
9. Respiration at high altitude (decreased barometric pressure) and at changes of environment air composition.
10. The underwater respiration (increased barometric pressure). Kesson disease.
11. Age related changes of digestion and absorption.
12. The physiological norms of nutrition depending on age, activity type and organism conditions. The changes of energy and substance exchange in people of different ages.
13. Peculiarities of thermoregulation in elderly and old people.
14. The physiological basis of hypothermia.
15. Aged related changes in urine formation and urination.
16. Peculiarities of physiological processes in male and female organisms.
17. Age related changes of vision and hearing.
18. The higher central nervous system activity changes in elderly and old people.