

Physiology Topic List- Theoretical Exam 1st Year

General part:

1. Water & body fluid compartments
2. Transport through the cell membrane. Units for measuring the concentration of solutes
3. Homeostasis

Nerves:

1. Neuron: structure, resting membrane potential
2. Stimulus excitation, action potential
3. Recording the excitability of the tissues, nerve degeneration & regeneration
4. Conduction of the excitation in the nerve fibres. Classification of nerve fibres in function of their speed of conduction
5. Reflex arch: receptors- classification, transduction of sensory stimuli into nerve impulses, coding of sensory information, adaptation of the receptors
6. Synapse: structure, mechanism of synaptic transmission, postsynaptic potentials, characteristics of synaptic transmission.

Muscles:

1. Structure & composition of the skeletal muscle
2. Molecular mechanism of muscle contraction & relaxation. Muscle contracture
3. Source of energy for the muscle contraction "all or none law" type of contraction. Treppe, electromyogram
4. Multi unit smooth muscle
5. Visceral (single unit) smooth muscle, muscle fatigue

Metabolism & Nutrition:

1. Metabolism. Measurement methods of the metabolic rate
2. Basal Metabolic Rate: normal values, factors of influence, Metabolism in daily conditions
3. Nutrition & dietary balance

Digestion & Absorption :

1. Characteristics of the gastrointestinal wall. Innervation of the gut- the enteric nervous system
2. Mouth Digestion: salivary glands, composition of saliva, mechanism of saliva secretion
3. Roles of saliva. Regulation of the salivary secretion
4. Mastication (chewing). Teeth physiology
5. Swallowing (deglutition)
6. Stomach: structure, organic substances in the gastric juice
7. Inorganic substances in the gastric juice. Mechanism of hydrochloric acid secretion
8. Regulation of the gastric secretion. Exploration of the gastric secretion
9. Motor functions of the stomach: basic electrical rhythm, filling of the stomach, stomach movements
10. Emptying the stomach. Gastric and duodenal factors that influence emptying it
11. Hunger contractions. Regulation of the stomach movements
12. Vomiting reflex. Exploration of the stomach motor functions
13. Pancreas: structure, composition of the pancreatic juice

14. Regulation of the pancreatic secretion
15. Liver: physiological anatomy, function of the hepatic vascular system, metabolic functions of the liver
16. Biliary tree. Bile formation. Composition of the bile
17. Bile salts and their functions. Cholesterol secretion
18. Excretion of the bilirubin in the bile.
19. Regulation of the bile secretion. Storage of the bile in the gallbladder. Emptying the gallbladder.
20. Secretion of the small intestine.
21. Movements of the small intestine
22. Absorption: methods to study the absorption. Absorption of proteins & carbohydrates in the small intestine.
23. Absorption of fats, ions & water in the small intestine.
24. Large intestine: structure, secretion & motility of the colon.
25. Absorption in the colon. Intestinal bacteria. Gases in the gastro-intestinal tract & flatus
26. Composition of feces. Defecation.
27. Hunger
28. Thirst.

Respiration:

1. Functions of the superior respiratory airways
2. Inspiration
3. Expiration
4. Pulmonary compliance. Recording the respiratory movements.
5. Exploration of the pulmonary ventilation
6. Alveolar gas exchange.
7. Transport of oxygen in the blood
8. Transport of carbon dioxide in the blood
9. Nervous regulation of the respiration. Respiratory centers. Influence of the neighbour & superior nervous centers of the respiratory centers.
10. Humoral regulation of the respiration. Respiration during exercise.
11. Reflexes that intervene in the regulation of the respiration.
12. Reflexes caused by irritation of the airways. Hypoxia, Hypercapnia, Asphyxia, pathological breathings.