

Syllabus for the Entrance Examination in Biology

I. The Human Body

1. Locomotive system
 - 1.1. The Skeleton. Bones of the skull.
 - 1.2. Trunk and limb bones.
 - 1.3. Skeletal muscles.
2. Cardiovascular System
 - 2.1. The internal body fluids. Blood.
 - 2.2. Blood groups.
 - 2.3. Heart and blood vessels.
3. Digestive System
 - 3.1. Digestion. Digestive organs - oral cavity, pharynx, oesophagus.
 - 3.2. Digestive organs - stomach, small intestine and large intestine.
4. Excretory System
 - 4.1. Structure and functions of the excretory organs.
5. Respiratory System
 - 5.1. Structure and functions of the respiratory organs.
6. Reproductive System
 - 6.1. Structure and function of male and female reproductive systems.
 - 6.2. Psycho-sexual development.
7. Endocrine System
 - 7.1. General structure and function. Hormonal regulation.
 - 7.2. Endocrine glands.
8. Nervous System
 - 8.1. General structure and principles of activity in the nervous system.
Nervous regulation.
 - 8.2. The brain.
 - 8.3. The spinal cord.
 - 8.4. Homeostasis. Thermoregulation.
 - 8.5. General structure and function of the sensory system. Visual sensory system.
 - 8.6. Other sensory systems - auditory, vestibular, kinesthetic, olfactory, gustatory and somatosensory.
 - 8.7. Higher nervous activity.
9. Immune System – immunological homeostasis.
 - 9.1. Immune system - organs and cells.
 - 9.2. Antigens and antibodies.

II. The Cell

1. Cell theory.
2. Chemical composition of the cell.
3. Inorganic substances-water and minerals.
4. Carbohydrates - monosaccharides and polysaccharides.
5. Lipids.
6. Proteins and polypeptide chains.
7. Structure and properties of proteins.
8. Biological catalysts - enzymes.
9. Nucleic acids. Deoxyribonucleic acids.
10. Ribonucleic acids.
11. Proteins and nucleic acids – structure.
12. Viruses - structure and biological importance.
13. Viruses-agents of diseases.
14. Prokaryotic cell - structure and functions.
15. Organization of eukaryotic cells.
16. Eukaryotic cell - plasma membrane, membrane bound organelles.
17. Eukaryotic cell – nucleus, structure of chromosomes.
18. Exchange of substances between cell and environment.
19. Providing the cell with proteins.
20. Taking particles in and secretion.
21. Providing the cell with energy.
22. Providing the cell with a program of existence.
23. Chromosomes.
24. Cellular surface.
25. Other cytoplasmic organelles.

III. Processes Taking Place in the Cell

1. The cell – a highly automated laboratory.
2. The role of adenosine triphosphate (ATP) in cell energetics.
3. Photosynthesis. Light reactions.
4. Dark reactions of photosynthesis. Effects of different factors on photosynthesis.
5. Breaking down of nutrients within the cell.
6. Biological oxidation.
7. Oxidative phosphorylation. Glycolysis. Krebs cycle
8. Synthesis of substances within the cell.
9. Replication – biosynthesis of DNA.
10. Transcription- biosynthesis of RNA.
11. Translation – biosynthesis of proteins.
12. Disturbances in human metabolism.

IV. Cell Reproduction

1. Cell cycle.
2. Cell division. Mitosis.
3. Meiosis.
4. Gametogenesis. Oogenesis and spermatogenesis.

References:

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