



Entrance exam topics

Biology

1. Chemical basis of life: Carbon, Oxygen, Nitrogen
2. Chemical groups, Water, pH, Lipids
3. Carbohydrates
4. Amino acids, Proteins, Biochemical reactions, Enzymes
5. Nucleosides, nucleotides, nucleic acids
6. Discovering the genetic material
7. Flow of genetic information: Genetic code
8. DNA replication
9. Structure of cells: Nucleus, nucleolus
10. Synthesis of RNAs: Transcription
11. Structure of cells II: Endoplasmic Reticulum
12. Synthesis of Proteins: Translation
13. Structure of the cells III: Cytoplasm, cytoskeleton, vesicles, cell membrane, cell wall, comparison of eu-, and prokaryotic cells
14. Structure of the cells: Mitochondria
15. Oxidative phosphorylation
16. Cell division I: Mitosis
17. Cell division II: Meiosis
18. Basics of Immunology
19. Circulation
20. Respiration
21. Excretion
22. Nervous system
23. Endocrine system
24. Digestion
25. Visceral organs
26. Muscle contraction
27. Viruses

Chemistry

1. Matter, atomic theory of matter
2. Periodic table
3. Nomenclature of inorganic compounds
4. Electronic structure of atoms
5. Stoichiometry, and chemical equations
6. Chemical bonds and intermolecular forces
7. Gaseous state (gas laws)
8. Solutions, concentrations
9. Reaction kinetics and chemical equilibria, catalysers
10. Electrolytic equilibria, acid-base theories, buffers
11. Redox reactions
12. Introduction to organic chemistry, alkanes
13. Cycloalkanes, alkenes, dienes and alkynes
14. Aromatic hydrocarbons and alkyl halides
15. Alcohols, phenols and ethers
16. Aldehydes and ketones
17. Carboxylic acids
18. Carboxylic acid derivatives (esters, amides), soaps
19. Amines, heterocyclic compounds (pyrrol and pyridine)
20. Carbohydrates
21. DNA and RNA chemical structures
22. Protein chemical structures
23. Lipid chemical structures
24. Alkali metals, halogens