Curriculum of Medical Biology

Zoology

1. Phylum Protozoa. Class Ciliata: Infusoria
2. Phylum Coelenterates: Polyp Hydra
3. Phylum Platyhelminthes. Class Turbellaria: Planaria
4. Phylum Ringed worms: Rainworm
5. Phylum Chordates: Lancelet

Structure and function of the human body

1. Body tissue and its types.
2. Endocrine glands.
3. Nervous system
   - Central nervous system (CNS): brain and spinal cord
   - Peripheral nervous system (PNS).
4. Structure and physiology of human eye.
5. Structure and physiology of human ear.
6. Musculoskeletal system and its function
   - Structure of the human skeleton.
7. Muscular system
   - Smooth muscles
   - Striated muscles
8. Blood
   - Blood cells
   - Blood clotting
9. Cardiovascular system
   - The heart structures
   - Large and small circulations
10. Respiratory system structure and functions
    - Airways
    - Lungs
11. Digestive system structure and functions
    - Digestion in the mouth
    - Digestion in the stomach
    - Digestion in the small intestine
    - The role of the liver in the digestive process.
12. Excretory system organs and their functions.
13. Skin structure and function.

Cytology

1. Cell as a structural, functional and developmental unit of living substance
2. Non-cellular forms of life (viruses and bacteriophages)
3. Cellular forms of life (prokaryotes and eukaryotes)
4. Plant and animal cells
5. Cell structure
6. Cell membrane. Structure and functions
7. Phagocytosis and pinocytosis

8. Membranous organelles of the cell (endoplasmic reticulum, Golgi complex, lysosomes, mitochondria, plastids). Structure and functions
9. Non-membranous organelles (ribosome, microtubules, microfilaments, cell center). Structure and functions
10. Cell inclusions
11. Cell nucleus (nuclear membrane, karyoplasm, nucleolus, chromatin)
12. Chromosome structure
13. Chromosome rules
14. Organic substances of the cell (proteins, lipids, carbohydrates). Structure and functions
15. Nucleic acids. DNA and RNA. Structure and functions
16. Genetic code and its characteristics
17. Transcription
18. Translation
19. Cell division. Direct and indirect divisions
20. Mitosis. Biological significance of mitosis
21. Reproduction. Sexual and asexual reproduction
22. Asexual reproduction in unicellular and multicellular organisms
23. Sexual reproduction in unicellular and multicellular organisms
24. Germ cells. Ovum and sperm cell. Structure
25. Gametogenesis
26. Meiosis, biological significance
27. Differences of spermatogenesis and oogenesis
28. Fertilization, biological significance
29. Parthenogenesis

Genetics

1. Main terminology of Genetics (heredity, variation, gen, genotype, phenotype, genome, allelic genes, homozygous, heterozygous, dominant and recessive genes)
2. Heredity and inheritance. Types of inheritance (nuclear, cytoplasmic, monogenic, polygenic, autosomal, sex-linked)
3. Monohybrid cross. First and second laws of Mendel
4. Test cross
5. Lethal and sublethal genes
6. Multiple alleles. ABO blood groups
7. Rh factor. Rh conflict
8. Dihybrid cross. Third iaw of Mendel
9. Linked inheritance. Morgan’s law
10. Inheritance of sex. Homogametic and heterogametic sex
11. Sex-linked inheritance
12. Gene and its properties
13. Interactions between allelic genes (complete and incomplete dominance, codominance, superdominance)
14. Interactions between non-allelic genes (complementarity, epistasis, polymery)
15. Modification variation
16. Combinative variation
17. Mutations, types of mutations (genome, chromosomal, gene)
18. Human genetics investigation methods (genealogical, twins, biochemical, cytogenetic)