

**MEDICAL ENTRANCE EXAMINATION - 2005
SYLLABUS - BIOLOGY**

UNIT 1: LIVING WORLD

- 1.1 Biology and its branches: relationship with other sciences; scientific methods in biology; historical break through (ancient, medieval and modern); scope in biology and career options; role of Biology in dispelling myths and misbeliefs; Characters of living organisms (elementary ideas of organization, metabolism, energy transfer devices of life, homeostasis, growth and reproduction, adaptation, survival and death).

UNIT 2: DIVERSITY OF PLANT LIFE

- 2.1 Systematics/Taxonomy and its importance; Artificial, natural and phylogenetic types of classifications with examples; Biosystematics; Binomial nomenclature (guidelines and merits); Systems of classification: a) Two Kingdom (brief description with emphasis on criteria and demerits). b) Five Kingdom (brief description with emphasis on criteria, merits and demerits); Descriptive features of kingdoms: Monera, Protista, Fungi, Plantae and Animalia; Status of virus; Botanical gardens and herbaria.
- 2.2 Plant Groups
- I. Thallophyta
 - a) Algae: Salient, comparative features of Rhodophyta, Phaeophyta and Chlorophyta with examples.
 - b) Fungi: Salient features of Myxomycetes, Phycomycetes, Ascomycetes and Basidiomycetes with examples.
 - c) Lichens: General features with examples.
 - II. Bryophyta: General features with special mention on aquatic to terrestrial evolution; alternation of generations of Hepaticae and Musci with examples.
 - III. Pteridophytes : General features with examples.
 - IV. Gymnosperms: General features with examples.
 - V. Angiosperms: Unique features of angiosperms with examples.
- 2.3 Morphology of Angiosperms
- Morphological structures of root, stem and leaf: Their structural and functional modification with examples.
- Inflorescence: Racemose, Cymose (different sub-types with examples), Special types (Cyathium, Verticillaster, Hypanthodium). Morphological characters of flower; Morphological differentiation of different types of fruits and seeds with examples.
- Taxonomy of Angiosperms : Description on classification of angiosperms upto series level (Bentham and Hooker's System).
- Description of Taxonomical Types (With floral diagram and floral formula)
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|----|-----------------|---|------------------------------------|
| 1. | Malvaceae | - | Eg. <i>Hibiscus rosasinensis</i> . |
| 2. | Fabaceae | - | Eg. <i>Crotalaria</i> sp. |
| | (Papilionaceae) | | |
| 3. | Rubiaceae | - | Eg. <i>Ixora</i> sp |
| 4. | Asteraceae | - | Eg. <i>Tridax</i> sp. |
| | (Compositae) | | |
| 5. | Liliaceae | - | Eg. <i>Gloriosa</i> sp. |
| 6. | Poaceae | - | Eg. <i>Oryza</i> sp. |
| | (Graminae) | | |
- 2.5 Plant Anatomy
- Tissue: Meristematic (Classification based on origin, position and plane of division); Permanent (Simple and complex types); Tissue systems (epidermal, ground and vascular); Anatomy of root and stem (primary structure) of monocot and dicot; Anatomy of leaf of monocot and dicot; Normal secondary growth of stem and root.

UNIT 3: CELL AND CELL DIVISION

- 3.1 Cell as a basic unit of life; Cell theory; Cell as a self-contained unit, unicellularity and multicellularity, prokaryotic and eukaryotic systems.

- Tools and techniques: Different types of optical microscope, electron microscope and cell fractionation (centrifugation, chromatography and electrophoresis).
- 3.2 Ultra Structure: Prokaryotic and eukaryotic cell, cell wall, cell membrane (Fluid Mosaic Model), unit membrane concept, membrane transport, cellular movements (endocytosis and exocytosis); Description of cell organelles and their functions (nucleus, mitochondria, plastids, endoplasmic reticulum, golgi bodies, lysosomes, cytoskeletal structures, cilia and flagella, centriole, ribosomes).
 - 3.3 Macromolecules of cell: Inorganic and organic materials (water, salt, mineral ions, carbohydrates, lipids, amino acids, proteins, nucleotides, nucleic acids (RNA and DNA), enzymes (properties, chemical nature and mechanism of action), vitamins, hormones and steroids.
 - 3.4 Cell cycle: Cell division, description of amitosis, mitosis and meiosis – their significance, differences in animal and plant cell divisions, karyotype analysis.

UNIT 4: PHYSIOLOGY OF PLANTS

- 4.1 Cell as a Physiological Unit: composition of protoplasm, water relations (imbibition, diffusion, osmosis, plasmolysis, permeability, water potential), absorption and movement – active (osmotic and non-osmotic) and passive.
- 4.2 Translocation of water: Theories -- root pressure, transpiration pull. Transpiration: Mechanism of opening and closing of stomata (potassium ion theory), factors affecting stomatal movement, factors affecting rate of transpiration, guttation, significance of transpiration.
- 4.3. Mineral nutrition: Functions of minerals, essential major elements and trace elements, deficiency symptoms of elements. Theories of translocation - passive (diffusion, ion exchange, mass flow, Donnan's equilibrium), active (carrier concept); Translocation of solutes (Stout and Hoagland concept). Nitrogen metabolism: Nitrogen cycle, biological nitrogen fixation, mechanism, synthesis of amino acids (reductive amination, transamination, amides).
- 4.4. Photosynthesis: Significance, photosynthetic apparatus, functional aspects of chlorophyll structure, action spectra and absorption spectra. Mechanism: Photochemical phase, photo phosphorylation (cyclic and non cyclic electron transport system), biosynthetic phase (C₃, C₄ and CAM pathways); Photorespiration and its mechanism; Factors affecting photosynthesis (Blackmann's law of limiting factor). Mode of nutrition: Autotrophic, heterotrophic, saprophytic and parasitic. Insectivorous plants. Chemosynthesis.
- 4.5. Respiration: Significance, site of respiration, mechanism: Glycolysis, Kreb's cycle, electron transport system and oxidative phosphorylation, pentose phosphate pathway: Respiratory quotient, compensation point; Anaerobic respiration, fermentation; Factors affecting respiration.

UNIT – 5 – REPRODUCTION, GROWTH AND DEVELOPMENT

- 5.1 Modes of reproduction in flowering plants
Vegetative propagation (natural and artificial), micro-propagation, significance. Sexual reproduction: Development of male and female gametophytes, pollination types and factors, double fertilization, incompatibility; embryo development, seed and fruit development, parthenogenesis and parthenocarpy.
- 5.2 Plant Growth
Characteristic features, measurement of growth, growth curve, growth rate, growth regulators (phytohormones): auxins, gibberellins, cytokines, ethylene, abscisic acid (ABA) and their role. Seed germination: types, mechanism and factors affecting germination, role of growth regulators in seed dormancy. Senescence, abscission, stress factors (salt and water) and growth. Plant movements: phototropism, geotropism, hydrotropism, turgor growth movements (tropic, nastic and nutation), Process of flowering, photoperiodism and vernalisation.

UNIT 6: ECOLOGY AND ENVIRONMENT

- 6.1 Organisms and their environment: Factors: abiotic (air, water, soil, temperature and light) and biotic; Range of tolerance, acclimatization, ecological adaptation to different environments in plants.
- 6.2 Levels of organization: Population, species, community, ecosystem and biosphere; Ecological interactions: Symbiosis, mutualism, commensalism, parasitism, predation and competition.
- 6.3 Ecosystem: Structure and function with respect to aquatic and terrestrial ecosystems (pond and grassland), productivity, energy flow, ecological efficiencies, decomposition and nutrient cycling (nitrogen and phosphorus cycle). Major biomes: Forest, grassland and deserts.

- 6.4 Ecological succession: Types and mechanism. Natural resources: Types: Inexhaustible. Exhaustible (renewable and non renewable). Principal natural resources: Soil, water, land, forest, energy, marine, mineral, Forest and wild life resource. Use and misuse of natural resources.
- 6.5 Environmental pollution: Sources of air, water, soil and noise pollution; Major pollutants in big cities in our country; their effects and methods of control. Pollution due to radioactive substances. Disposal of nuclear wastes. Effect and control of radiation pollution.
- 6.6 Global environmental changes: green house gases, global warming, sea level rise, and ozone layer depletion.

UNIT 7 – APPLICATIONS OF BIOLOGY

- 7.1 Food production, breeding, improved varieties, bio-fertilizers, crop and animal diseases, bio-pesticides.
Plant tissue culture and its application, genetically modified food, bio-war, bio-piracy, bio-patent, biotechnology and sustainable agriculture.

UNIT 8 - ORIGIN AND EVOLUTION OF LIFE

- 1. Origin of Earth 1.1 Theory of Origin of Earth 1.1.1 Big Bang Theory
- 2. Origin of Life 2.1 Various Theories 2.1.1 Special Creation 2.1.2 Cosmic (extra terrestrial) origin, 2.1.3 abiogenic origin (chemical evolution) 2.1.4 Oparin-Haldane Hypothesis.
- 3. Primary abiogenesis 3.1 Harold Urey & Stanley Miller experiment 3.1.1 Primitive conditions of earth 3.1.2 Formation of biopolymers 3.1.4 factors required for polymeric biomolecules 3.1.5 Conditions required for origin of life 3.1.6 Protobionts, coacervates, microspheres, purine & pyrimidine bases of nucleic acids.
- 4. Theories of Evolution 4.1.1 Plato – Eidos 4.1.2 Aristotle, Ladder of Nature or Scala , Nature or Great Chain of being 4.1.3 Lamarckism (J.B.Lamarck) -Theory of Inheritance of Acquired Characters or Theory of Use and Disuse 4.1.4 Principle & Criticism (NeoLamarckism).
- 5. Darwin's Theory of Evolution 5.1 Natural Selection 5.1.1 Principle of Natural Selection – 5.1.2 Example of Natural Selection - Industrial Melanism 5.1.3 Criticism of Darwin's Theory – 5.1.4 Neodarwinism.
- 6. Mutation Theory of de Vries 6.1.1 Observation on *Oenothera lamarckiana* 6.1.2 Principles & Criticism of Theory of Mutation.
- 7. Evidences of Evolution 7.1.1 Palaentological, Embryological 7.1.2 Morphological 7.1.3 Anatomical 7.1.4 Biogeographical.
- 8. Variation 8.1 Definitions 8.1.2 Sources of Variation 8.1.3 Mutation 8.1.4 Recombination 8.1.4 Genetic drift 8.1.5 Gene migration and natural Selection.
- 9. Population Genetics & Evolution 9.1 Hardy Weinberg Equilibrium.
- 10. Genetic Basis of Adaptation 10.1.1 Replica plating experiment of Lederberg and Lederberg 10.1.2 Genetic Polymorphism – Eg: Blood group & sickle cell anaemia
- 11. Speciation – 11.1.1 Allopatric & Sympatric speciation 11.1.2 Species concept 11.1.3 Sibling species, Polytypic species 11.1.4 Evolutionary species concept
- 12. Isolation 12.1.1 role of Isolation in speciation 12.1.2 Geographical isolation 12.1.3 Reproductive isolation.

UNIT 9 – CLASSIFICATION OF ANIMALS

- 1. Salient features of different Phyla with examples. 1.1 General features of animals 1.1.1 Grades of organization and body plan 1.1.2 body symmetry 1.1.3 germ layers (diploblastic & triploblastic organization) 1.1.4 segmentation 1.1.5 coelom 1.1.6 Heterotrophic mode of Nutrition 1.1.7 Movement 1.1.8 Reproduction and Development
- 2. **Kingdom Protista** (Protozoan Protists only) eg: Amoeba, Paramecium, Trypanosoma, Entamoeba, Plasmodium
- 3. **Phylum Porifera** eg: Sycon, Leucosolenia, Spongilla
- 4. **Phylum Cnidaria** eg: Hydra, Obelia colony, Physalia, Aurelia, Sea Anemone, Corals
- 5. **Phylum Platyhelminthes** eg.: Taenia, Fasciola, Planaria
- 6. **Phylum Nematelminthes** eg: Ascaris, Rhabditis, Wuchereria, Ancylostoma
- 7. **Phylum Annelida** eg: Nereis, Aphrodite, Pheretima, Hirudinaria, Chaetopterus, Bonellia

8. **Phylum Arthropoda** eg: Araneus (Spider), Limulus (King Crab), Bruthus (Scorpion), Eupgurus (Hermit Crab), Penaeus (Marine prawn), Palaemon (fresh water prawn), Lepisma, Apis, Musca (House fly), Mosquito, Leptocorisa (paddy pest), Barnacles, Silk worm, Oryctes
9. **Phylum Mollusca** eg: Pila, Mussel (fresh water & marine), Pinctada, Loligo, Octopus, Teredo
10. **Phylum Echinodermata** eg: Asterias, Echinus, Antedon, Sea cucumber, Ophiura.
11. **PHYLUM CHORDATA: Subphylum [a]-Hemichordata** eg: Balanoglossus **Subphylum [b]-Urochordata** eg: Ascidia.. **Subphylum [c]** - Cephalochordata eg: Amphioxus **Subphylum [d]-Vertebrata**–Classification up to classes
12. **Super class I. Agnatha. Class** – Cyclostomata eg: Petromyzon and Myxine.
13. **Super class II. Gnathostomata Class a - Chondrichthyes** (Cartilaginous fishes) eg.: Scoliodon, Trygon, Torpedo (Narcine), Pristis. **Class b. Osteichthyes** (Bony fishes) eg.: Catla, Anabas, Channa, Exocoetus, Remora, Hippocampus, Tuna, Cybium, Pomfret, Etroplus, Tilapia, Sardine, Mackerel. **Class c. Amphibia** eg: Bufo, Rana, Hyla, Rhacophorus, Salamander, Amblystoma, Ichthyophis **Class d. Reptilia** eg: Chelone, Testudo, Sphenodon, Hemidactylus, Chameleon, Calotes, Draco, Phrynosoma, Varanus, Python, Naja, Krait, Viper, Crocodile, Alligator, Gavialis, Crotalus, Enhydrina, Dryophis, Typhlops. **Class e. Aves** eg: Ardea (Grey Heron), Corvus, Paro, Gallus, Columba, Psittacula, Bubo, Milvus, Struthio (Ostrich), Kiwi, **Class f. Mammalia** eg: Platypus, Kangaroo, Mole, Bat, Whale, Loris, Macaques, *Macaca radiata*, *Macaca silenus* (Lion-tailed monkey) Common Langur, Gorilla, Chimpanzee, Orangutan, Panthera, Elephas.

UNIT 10 - Animal Morphology

1. External and internal morphology 1.1 Earthworm 1.2 Cockroach 1.3 Frog 1.4 Rat.

UNIT 11 - Animal Tissues

1. Definition 1.1.1 Types of tissues 1.1.2 Epithelial tissue - different types with examples, specialized epithelial tissue with examples 1.1.3 Connective tissue with examples 1.1.4 Muscular tissue with examples 1.1.5 Nervous tissue with examples 1.1.6 Structure and functions of these tissues.

UNIT 12 - Genetics

1. Heredity and variation -1.1.1 Mendel's experiments 1.1.2 Laws of Mendel 1.1.3 Chromosome theory of inheritance 1.1.4 Pattern of inheritance 1.1.5 Incomplete dominance 1.1.6 Epistasis 1.1.7 Multiple allelism 1.1.8 Quantitative inheritance 1.1.9 Pleiotropy
- 2.1 Chromosomes 2.1.1 Prokaryotic & Eukaryotic Chromosomes 2.1.2 Nucleosomes 2.1.3 Chromosome theory of inheritance 2.1.4 Concept of linkage and crossing over recombination 2.1.5 Principle of gene mapping 2.1.6 sex linked inheritance 2.1.7 sex determination 2.1.8 sex limited and sex influenced inheritance.
3. Mutation 3.1 Gene mutation – 3.1.1 Chromosomal aberration 3.1.2 Polyploidy, aneuploidy and Euploidy 3.1.3 Mutation causing agents.
4. Human Genetics 4.1 Pedigree Analysis 4.2 Genetic Disorders 4.2.1 Sickle cell anaemia 4.2.2 Phenylketonuria 4.2.3 Alzheimer's disease 4.2.4 Down's Syndrome 4.2.5 Turner's Syndrome 4.2.6 Klinefelter's Syndrome.
5. Nature of Genetic Material 5.1 DNA and its structure 5.1.1 Different types of DNA 5.1.2 RNA and its structure 5.1.3 Experiments to prove genetic nature of DNA.
6. DNA and Gene 6.1 DNA Replication 6.1.2 Gene expression- Gene and Protein 6.1.3 Biosynthesis of Protein 6.2 Regulation of Gene expression in prokaryotes and eukaryotes- 6.2.1 House keeping genes 6.3 Genes in differentiation and development 6.4 Oncogenes.

Unit 13 - Applied Genetics

1. Recombinant DNA technology 1.1 Genetic Engineering and its tools 1.1 gene transfer 1.1.2 application of recombinant DNA technology 1.1.3 Gene Library 1.1.4 Medical Diagnosis of diseases.
2. Cloning 2.1 various types of cloning 2.1.1 Microbial cloning 2.1.2 Cell cloning 2.1.3 Plant cloning. 2.1.4 Animal cloning 2.1.5 transgenic organisms (Plant, animals and microbes)
3. Genomics 3.1 Principles and application 3.1.1 Human genome project 3.1.2 DNA Diagnosis 3.1.3 Gene Therapy 3.1.4 DNA finger printing 3.1.5 ethical, legal, social concerns associated with gene manipulations.

Unit 14 - Physiology of Animals

- Nutrition 1.1.1 Different types of nutrition 1.1.2. Different types of nutrients 1.1.3. Malnutrition 1.1. 4. Under nutrition 1.1. 5. Disorders related to nutrition.
- Digestion 2.1.1. Intracellular and Extracellular digestion with examples. 2.1.2. Digestive system of Cockroach. 2.1.3. Glands associated with the alimentary canal. 2.1.4. Different enzymes secreted by the alimentary canal. 2.1.5. Bacteria involved in the synthesis of enzymes. 2.1.6. Functions of various enzymes. 2.1.7. Role of various regions of alimentary canal in absorption. 2.2. Human Digestive System. 2.2.1. Structure of alimentary canal and associated glands and their secretions. 2.2.2. Buccal cavity and structures associated with it. 2.2.3. Process of ingestion and digestion at various regions of alimentary tract. 2.2.4. Mechanism of absorption and assimilation of digested food components. 2.2.5. Egestion 2.2.6. Role of gastrointestinal hormones in digestion.
- Respiration 3.1.1. Aerobic Respiration 3.1.2. Anaerobic respiration. 3.2 Respiration in cockroach. 3.2.1. Spiracles and tracheal system 3.2.2 Haemocoel 3.2.3 Mechanism of gas exchange. 3.3 Human Respiratory system. 3.3.1. Respiratory organs and mechanism involved in pulmonary respiration. 3.3.2. Gas exchange and transport of respiratory gases. 3.3.3 Respiratory pigments involved 3.3.4 Regulation of respiration 3.4 Respiratory disorders 3.4.1 Bronchitis 3.4.2 Bronchial Asthma 3.4.3 Emphysema 3.4.4 Pneumonia 3.4.5 Occupational lung diseases 3.4.6 Causes of these disorders – symptoms, prevention and cure of these disorders 3.4.7 High altitude problems – mountain sickness, asphyxia and hypoxia 3.5 Carbon Monoxide poisoning.
- Circulation 4.1.1 Open circulatory system with examples 4.1.2 Closed circulatory system with examples 4.1.3 composition of blood 4.1.4 structure and functions of different types of blood cells. 4.2 Structure and working of heart 4.2.1 pulmonary, systemic and portal circulation 4.2.2 Pulse, heart beat and blood pressure 4.2.3 Rhythmicity of heart 4.2.4 Regulation of heart beat 4.2.5 Blood related disorders – hypertension, atherosclerosis and arteriosclerosis 4.2.6 Echo cardiogram 4.2.7 Pacemaker 4.3 Lymphatic system 4.3.1 Lymph 4.3.2 Lymph node 4.3.3 Lymph vessels 4.3.4 functions of lymph 4.3.5 Lymphoid organs. 4.4 Immunity and immune systems 4.4.1 Immunology 4.4.2 Innate (Non-specific) 4.4.3 Acquired immunity 4.4.4 Active immunity 4.4.5 Passive immunity 4.4.6 Cell mediated immunity 4.4.7 Antibody mediated immunity 4.5 Clonal Selection and Primary and Secondary immune responses 4.6 Immune disorders 4.7 Vaccinisation and Immunization (using traditional vaccines and recent technological vaccines).
- Excretion. 5.1.1 Definition. 5.1.2 Different types of excretory organs in animals. 5.1.3 Skin, lungs and liver as excretory organs. 5.2 Nitrogenous excretion 5.2.1 Different types of Nitrogenous excretion with examples. 5.2.2. Ammenotelism, ureotelism and uricotelism. 5.3 Excretory system in Cockroach 5.3.1 Excretory organs-Malpighian tubules and rectum. 5.3.2. Role of Malpighian tubules and rectum in excretion and osmoregulation. 5.4. Excretory system in man. 5.4.1 Structure of kidney 5.4.2 Composition and formation of urine 5.4.3 Role of Kidney in osmoregulation 5.4.4 Hormonal regulation of excretory system. 5.4.5 Dialysis.
- Locomotion and Movement. 6.1.1 Different modes of movement with examples 6.2.1 Human skeleton 6.2.2 Axial and appendicular skeleton. 6.3 Joints 6.3.1 Types of joints with examples 6.4 Bone and cartilage 6.4.1 Structure of Bone and Cartilage 6.4.2 Disorders of bone and cartilage (Arthritis and Osteoporosis)
- Muscles. 7.1.1 Different types of muscles 7.1.2 Structure of skeletal muscle 7.1.3 Mechanism of muscle contraction 7.1.4 Role of red and white muscles in movement. 7.1.5 Role of muscles and bones in movement.
- Nervous Co-ordination 8.1 Nervous system in cockroach 8.1.1 Morphology of nervous system in cockroach 8.2. Human nervous system 8.2.1 Morphology of functional subsystems of nervous system. 8.2.2 Different types of nerve cells. 8.3 Structure and functions of brain and spinal cord. 8.4 Nerve impulse. 8.4.1 Synapse 8.4.2 Transmission and conduction of nerve impulse 8.5 Reflex action. 8.5.1 Reflex arc 8.6. Sensory receptors. 8.6.1 Structure and functions of eye, ear, nose, tongue and skin.

9. Hormones 9.1 Different types of hormones 9.2 Hormones produced by human endocrine glands and their functions. 9.3 Hormone imbalance and disorders 9.4 Role of hormones as messengers and regulators. 9.5 Feed back control of various hormones.

Unit 15 - Reproduction and Development in animals

1. Reproduction 1.1 Asexual Reproduction. 1.1.1 Different types of asexual reproduction with examples 1.1.2 Sexual reproduction 1.2.1 Conjugation, hermaphroditism and parthenogenesis with examples.
1.3 Reproductive organs. 1.3.1 Structure and function of human male and female reproductive system. 1.3.2 Reproductive cycle in human female 1.3.3 Gametogenesis 1.3.4 fertilization (Physical and chemical events) 1.3.5 Development of zygote up to 3 germinal layers and their derivatives.
1.4 Extra embryonic membranes. 1.4.1 Structure and functions of placenta
1.5. Growth 1.5.1 Definition 1.5.2 Embryonic, post embryonic and cellular growth. 1.5.3 Types of growth and growth curve 1.5.4. Hormonal control of growth.
1.6 Ageing: 1.6.1 Definition. 1.6.2 Life span and life expectancy 1.6.3. Ageing of human organs. 1.6.4 Process of ageing and theories related to ageing 1.6.5. Ageing and death.
1.7 Regeneration 1.7.1 Definition 1.7.2 Regeneration among animals 1.7.3 Types of regeneration. 1.7.4 Factors controlling amphibian limb regeneration.

Unit 16 -Biodiversity and Conservation

1. Biotic resources. 1.1 Terrestrial biotic resources. 1.1.1 forests 1.1.2 Grassland 1.1.3 wild life 1.1.4. Domesticated animals.
1.2 Aquatic biotic resources. 1.2.1 Marine biotic resources (animal resources) 1.2.2 fresh water biotic resources.
2. Biodiversity 2.1.1 Definition 2.1.2 Significance of biodiversity 2.1.3 Magnitude of biodiversity 2.1.4 Levels of biodiversity 2.1.5 gradients of biodiversity 2.1.6 Uses of biodiversity 2.1.7 Threats of biodiversity.
3. Endangered species 3.1.1 Extinction 3.1.2 Causes of extinction.
4. Conservation of biodiversity 4.1.1 Biosphere reserves 4.1.2 protected areas 4.1.3 National and international efforts 4.1.4 Role of Government and non-government organizations in conservation of bio-diversity 4.1.5 Environmental ethics 4.1.6 Legislation to conserve biodiversity 4.1.7 Responsibility of individual in biodiversity conservation.

UNIT 17 - Biology in Human Welfare

1. Population. 1.1.1 Role of environment in population 1.1.2 Role of development in population.
2. Population Growth. 2.1.1 Characteristics of population growth 2.1.2 Factors affecting population growth - Natality, Mortality, Immigration, Age and Sex ratio 2.1.3 Impact of Population growth.
3. Common problems of adolescence 3.1.1 Social and moral implications 3.1.2 Problems associated with drugs, smoking and alcoholism.
4. Population as a resource. 4.1.1 Generation of useful products and services- Intellectual, social, economic and political resources. 4.1.2 Conservation of existing resources.
5. Organ transplantation 5.1.1. Transplantation of Skin, Kidney, Heart, Liver, Lungs, Cornea, Bone marrow, Blood and Pancreas
6. Modern techniques in disease diagnosis. 6.1 AIDS and SCID. 6.1.1 Causes 6.1.2 Diagnosis- ELISA, WESTERN BLOT 6.1.3 Treatment. 6.2.1 STD -different types of STD 6.2.2. Causative agents 6.2.3 Diagnosis -Microscopic examination, Gram-staining of discharge, antigen/antibody detection, Culture, DNA hybridization, PCR 6.2.4 Treatment 6.3 Cancer 6.3.1 Types of Cancer 6.3.2 Various causes. 6.3.3 Diagnosis- Blood test, Histopathology, CT Scan, MRI Scan, Xray (using injected dyes) 6.3.4 Treatment.
7. Biotechnology. 7.1.1. Hormones produced using biotechnology. 7.2. Hormone therapy 7.2.1 Hormone blocking and hormone –Supplementing therapy.
8. Interferon. 8.1.1. Definition 8.1.2. Different types of interferon 8.1.3. Role of interferon in medical treatment
9. Immuno modulations. 9.1. Immunomodulators - different approaches.
