

BIOLOGY (Theory)

CLASS XII

Time : 3 Hours

One Paper

Marks : 70

Unit	Marks
1. Reproduction	14
2. Genetics and evolution	18
3. Biology and human Welfare	14
4. Biotechnology and its applications	10
5. Ecology and environment	14
Total	70

UNIT-I

I REPRODUCTION

Reproduction in organisms : Asexual and sexual reproduction. Sexual reproduction in flowering plants : Structure of flower, pollination, fertilization, development of seeds and fruits, apomixis and polyembryony.

Human reproduction : Reproductive system in male and female, menstrual cycle, production of gametes, fertilization, implantation, embryo development, pregnancy, parturition and lactation.

Reproductive Health : Population and birth control, contraception and MTP; sexually transmitted diseases, infertility.

UNIT-II

II GENETICS AND EVOLUTION

Mendelian inheritance.

Chromosome theory of inheritance, deviations from Mendelian ratio (gene interaction-incomplete dominance, co-dominance, multiple alleles).

Sex determination in human beings: XX, XY.

Linkage and crossing over.

Inheritance pattern : Mendelian disorders and chromosomal disorders in humans.

DNA and RNA, search for genetic material, replication, transcription, genetic code, translation.

Gene expression and regulation.

Genome and Human Genome Project.

DNA fingerprinting.

Evolution: Origin of life, theories and evidences, adaptive radiation, mechanism of Evolution, origin and evolution of man.

UNIT -III

III BIOLOGY AND HUMAN WELFARE

Basic concepts of immunology, vaccines.

Pathogens, Parasites

Cancer and AIDS

Adolescence and drug / alcohol abuse.

Plant breeding, tissue culture, single cell protein, food production, animal husbandry.

Mircobes in household food processing, industrial production, sewage treatment, energy generation, biocontrol agents and biofertilizers.

UNIT -IV

IV BIOTECHNOLOGY AND ITS APPLICATION

Principles and Processes; Recombinant DNA technology; Application in Health and Agriculture; genetically modified (GM) organisms; biosafety issues.

UNIT -V

V ECOLOGY & ENVIRONMENT

Ecosystems : components, types, energy flow, nutrient cycling and ecosystem services.

Organism and Population : Organisms and its environment, population and ecological adaptations.

Centres of diversity and conservation for biodiversity, Biosphere reserves, National parks and sanctuaries. Environmental issues.

Practicals

Time: 3 Hours

Marks : 30

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| 1. Experiments and spotting | 20 marks |
| 2. Record of one investigatory project and Viva based on the project | 5 marks |
| 3. Class record and Viva based on experiments | 5 marks |

List of Experiments

1. Dissect the given flower and display different whorls. Dissect anther and ovary to show number of chambers.
2. Study pollen germination on a slide.
3. Collect and study soil from at least two different sites and study them for texture, moisture content, pH and water holding capacity of soil. Correlate with the kinds of plants found in them.
4. Collect water from two different water bodies around you and study them for pH, clarity and presence of any living organisms.
5. Study the presence of suspended particulate matter in air at the two widely different sites.
6. Study of plant population density by quadrat method.
7. Study of plant population frequency by quadrat method.
8. Prepare a temporary mount of onion root tip to study mitosis
9. To study the effect of the different temperatures and three different pH on the activity of salivary amylase on starch.

Study/observation of the following (Spotting)

1. Study of flowers adapted to pollination by different agencies (wind, insect)
2. Study of pollen germination on stigma through a permanent slide.
3. Study and identify stages of gamete development i.e. T.S. testis and T.S. ovary through permanent slides. (from any mammal)
4. Study meiosis in onion bud cell or grass hopper testis through permanent slide.
5. Study of T.S. of blastula through permanent slide.
6. Study Mendelian inheritance using seeds of different colour/size of any plant.
7. Study prepared pedigree charts of genetic traits such as rolling of tongue, blood groups, widow's peak, colour blindness.
8. Exercise on controlled pollination-Emasculation, tagging and bagging.
9. To identify common disease causing organisms like *Ascaris*, *Entamoeba*, *Plasmodium*, Ringworm through permanent slide or specimen. Comment on symptoms of diseases that they cause.
10. Study two plants and two animals found in xerophytic condition. Comment upon their adaptations/morphological.
11. Study plants and animals found in aquatic conditions. Comment upon their adaptations/ morphological.