

Biology

+2 Sc (2021-22) 2nd Year (Theory)

I. Reproduction

a. Sexual reproduction in flowering plants: Flower structure; Development of male and female gametophytes; Pollination-types, agencies and examples; Outbreeding devices; Pollen-Pistil interaction; Double fertilization; Post fertilization events Development of endosperm and embryo, Development of seed and formation of fruit; Special modesapomixis, parthenocarpy, polyembryony; Significance of seed and fruit formation.

b. Human Reproduction: Male and female reproductive systems; Microscopic anatomy of testis and ovary; Gametogenesis spermatogenesis & oogenesis; Menstrual cycle; Fertilisation, embryo development upto blastocyst formation, implantation; Pregnancy and placenta formation (Elementary idea); Parturition (Elementary idea);

Lactation (Elementary idea). (10)

Reproductive health: Need for reproductive health and prevention of sexually transmitted diseases (STD); Birth control- Need and Methods, Contraception and Medical Termination of Pregnancy (MTP); Amniocentesis; Infertility and assisted reproductive technologies -IVF, ZIFT, GIFT (Elementary idea for general awareness). (08)

II. Genetics and Evolution (Periods 20)

a. **Heredity and Variation:** Mendelian Inheritance; Deviations from Mendelism-Incomplete dominance, Co-dominance, Multiple alleles and Inheritance of blood groups, Pleiotropy; Elementary idea of polygenic inheritance; Chromosome theory of inheritance; Chromosomes and genes; Linkage and crossing over.

b. Sex determination- In humans, birds, honey bee; Sex linked inheritance- Haemophilia, Colour blindness; Mendelian disorders in humans- Thalassaemia; Chromosomal disorders in humans- Down's syndrome, Turner's and Klinefelter's syndromes.

c. Molecular Basis of Inheritance: Search for genetic material and DNA as genetic material; Structure of DNA and RNA; DNA packaging; DNA replication; Central dogma; Transcription, Genetic code, Translation; Gene expression and regulation- Lac Operon; Genome and human genome project; DNA finger printing.

d. Deleted

III. Biology and Human Welfare (Periods 08)

a. health and Disease: Pathogens; parasites causing human diseases (Malaria, Filariasis, Ascariasis, Typhoid, Pneumonia, common cold, amoebiasis, ring worm); Basic concepts of immunology- vaccines; Cancer, HIV and AIDS; Adolescence, drug and alcohol abuse. (04)

b. Improvement in food production:

- i), Biofortification;
- ii)

c. Microbes in human welfare: In household food processing, industrial production, sewage treatment, energy generation and as biocontrol agents and biofertilizers.

IV. Biotechnology and its Applications (Periods 08)

a. Principles and process of Biotechnology: Genetic engineering (Recombinant DNA technology). (04)

b. Application of Biotechnology in health and agriculture: Human insulin and vaccine production, gene therapy; Genetically modified organisms- Bt crops; Transgenic Animals; Biosafety issues- Biopiracy and patents. (04)

V. Ecology and environment (Periods 12)

a. Organisms and environment: Habitat and niche; Population and ecological adaptations; population interactions- mutualism, competition, predation, parasitism; Population attributes-growth, birth rate and death rate, age distribution.

b. Deleted

c. Biodiversity and its conservation: Concept of Biodiversity; Patterns of Biodiversity; Importance of Biodiversity; Loss of Biodiversity, conservation; Hotspots, endangered organisms, extinction, Red Data Book: Biosphere reserves, National parks and Sanctuaries.

Environmental issues: Deleted