Biology Class 12 Syllabus

Exam Structure

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| **Unit** | **Title** | **Marks** |
| VI | Reproduction | 14 |
| VII | Genetics and Evolution | 18 |
| VIII | Biology and Human Welfare | 14 |
| IX | Biotechnology and its Applications | 10 |
| X | Ecology and Environment | 14 |
|  | **Total** | **70** |

Unit VI. Reproduction

**Chapter-1: Reproduction in Organisms**

Reproduction, a characteristic feature of all organisms for continuation of species; Asexual reproduction Modes of reproduction-Asexual and sexual reproduction; Modes-Binary fission, sporulation, budding, gemmule, fragmentation; vegetative propagation in plants.

**Chapter-2: Sexual Reproduction in Flowering Plants**

Flower structure; Development of male and female gametophytes; Pollination-types, agencies and examples; Outbreedings devices; Pollen-Pistil interaction; Double fertilization; Post fertilization events-Development of endosperm and embryo, Development of seed and formation of fruit; Special modes-apomixis, parthenocarpy, polyembryony; Significance of seed and fruit formation.

**Chapter-3: 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).

**Chapter-4: 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).

Unit VII. Genetics and Evolution

**Chapter-5: Principles of Inheritance 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; Sex determination - in humans, birds, honey bee; Linkage and crossing over; Sex linked inheritance - Haemophilia, Colour blindness; Mendelian disorder in humans - Thalassemia; chromosomal disorders in humans; Down's syndrome, Turner's and Klinefelter's syndromes.

**Chapter-6: 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 ganeome project; DNA fingerprinting.

**Chapter-7: Evolution**

Origin of life; Biological evolution and evidences for biological evolution (Paleontological, comparative anatomy, embryology and molecular evidence); Darwin's contribution, Modern Synthetic theory of Evolution; Mechanism of evolution - Variation (Mutation and Recombination) and Natural Selection with examples, types of natural selection; Gene flow and genetic drift; Hardy - Weinberg's principle; Adaptive Radiation; Human evolution.

Unit VIII. Biology and Human Welfare

**Chapter-8: Human Health and Diseases**

Pathogens; parasites causing human diseases (Malaria, Filariasis, Ascariasis, Typhoid, Pneumonia, common cold, amoebiasis, ring worm); Basic concepts of immunology - vaccines; Cancer, HIV and AIDs; Adolescene, drug and alcholol abuse.

**Chapter-9: Strategies for Enhancement in Food Production**

Improvement in food production : Plant breeding, tissue culture, single cell protein, Biofortification, Apiculature and Animal husbandry.

**Chapter-10: Microbes in Human Welfare**

In household food processing, industrial production, sewage treatment, energy generation and as biocontrol agents and biofertilizers. Antibiotics; production and judicious use.

Unit IX. Biotechnology and Its Applications

**Chapter-11: Biotechnology - Principles and Processes**

Genetic engineering (Recombinant DNA technology).

**Chapter-12: Biotechnology and its Application**

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.

Unit X. Ecology and Environment

**Chapter-13: Organisms and Populations**

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

**Chapter-14: Ecosystem**

Patterns, components; productivity and decomposition; energy flow; pyramids of number, biomass, energy; nutrient cycles (carbon and phosphorous); ecological succession; ecological services - carbon fixation, pollination, seed dispersal, oxygen release (in brief).

**Chapter-15: Biodiversity and its Conservation**

Concept of biodiversity; patterns of biodiversity; importance of biodiversity; loss of biodiversity; biodiversity conservation; hotspots, endangered organisms, extinction, Red Data Book, biosphere reserves, national parks, sanctuaries and Ramsar sites.

**Chapter-16: Environmental Issues**

Air pollution and its control; water pollution and its control; agrochemicals and their effects; solid waste management; radioactive waste management; greenhouse effect and climate change; ozone layer depletion; deforestation; any one case study as success story addressing environmental issue(s).