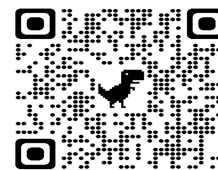


**Annual Syllabus**  
**Session: 2023-24**  
**Subject –Biology (044)**  
**Class-XII**



**Orientation and Recapitulation:** Discussion on importance of Biology, scope of Biology and other topics of interest.

**Unit-VI Reproduction: Marks 16**

**Chapter-2: 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 modes- apomixis, parthenocarpy, polyembryony; Significance of seed dispersal and fruit formation

**Chapter-3: Human Reproduction**

Male and female reproductive systems; microscopic anatomy of testis and ovary; gametogenesis - spermatogenesis and 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 (STDs); 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).

**Practicals** (Practicals should be conducted alongside the concepts taught in theory classes.)

- ✓ Prepare a temporary mount to observe pollen germination.
- ✓ Pollen germination on stigma through a permanent slide.
- ✓ Flowers adapted to pollination by different agencies (wind, insects, birds)
- ✓ Controlled pollination - emasculation, tagging and bagging.
- ✓ Identification of stages of gamete development, i.e., T.S. of testis and T.S. of ovary through permanent slides (from grasshopper/mice).
- ✓ T.S. of blastula through permanent slides (Mammalian).

**Unit-VII Genetics and Evolution: Marks 20**

**Chapter-5: Principles of Inheritance and Variation**

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; Sex determination - in human being, birds and honey bee; linkage and crossing over; sex linked inheritance - haemophilia, colour blindness; Mendelian disorders 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, Human and rice genome projects; DNA fingerprinting.

**Chapter-7: Evolution**

Origin of life; biological evolution and evidences for biological evolution (palaeontology, comparative anatomy, embryology and molecular evidences); 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

**Practicals** (Practicals should be conducted alongside the concepts taught in theory classes.)

- ✓ Meiosis in onion bud cell or grasshopper testis through permanent slides.
- ✓ Prepared pedigree charts of any one of the genetic traits such as rolling of tongue, blood groups, ear lobes, widow's peak and colour blindness.
- ✓ Mendelian inheritance using seeds of different colour/sizes of any plant (monohybrid and dihybrid ratio verification)
- ✓ Flash cards or models showing examples of homologous and analogous organs.

**Unit-VIII Biology and Human Welfare, Marks: 12****Chapter-8: Human Health and Diseases**

Pathogens; parasites causing human diseases (malaria, dengue, chikungunya, filariasis, ascariasis, typhoid, pneumonia, common cold, amoebiasis, ring worm) and their control; Basic concepts of immunology - vaccines; cancer, HIV and AIDS; Adolescence - drug and alcohol abuse.

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

Microbes in food processing, industrial production, sewage treatment, energy generation and microbes as bio-control agents and bio-fertilizers. Antibiotics; production and judicious use.

**Practicals** (Practicals should be conducted alongside the concepts taught in theory classes.)

- ✓ Common disease-causing organisms like Ascaris, Entamoeba, Plasmodium, any fungus causing ringworm through permanent slides, models or virtual images. Comment on symptoms of diseases that they cause

**Unit-IX Biotechnology and its Applications, Marks: 12****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, stem cell technology, gene therapy; genetically modified organisms - Bt crops; transgenic animals; biosafety issues, biopiracy and patents.

**Practicals** (Practicals should be conducted alongside the concepts taught in theory classes.)

- ✓ Prepare a temporary mount of onion root tip to study mitosis.
- ✓ Isolate DNA from available plant material such as spinach, green pea seeds, papaya, etc.

**Note: Completion of mid-term syllabus by 15th September 2023.**

**Mid –Term Examination 2023**

**Unit-X Ecology and Environment, Marks: 10**

**Chapter-13: Organisms and Populations**

Population interactions - mutualism, competition, predation, parasitism; population attributes - growth, birth rate and death rate, age distribution. (Topics excluded: Organism and its Environment, Major Abiotic Factors, Responses to Abiotic Factors, Adaptations)

**Chapter-14: Ecosystem**

Ecosystems: Patterns, components; productivity and decomposition; energy flow; pyramids of number, biomass, energy (*Topics excluded: Ecological Succession and Nutrient Cycles*)

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

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

**Practical**(Practicals should be conducted alongside the concepts taught in theory classes.)

- ✓ Study the plant population density by quadrat method.
- ✓ Study the plant population frequency by quadrat method.
- ✓ Models specimen showing symbiotic association in root modules of leguminous plants, *Cuscuta* on host, lichens.

- **Annual syllabus is to be completed by 15th December 2023.**
- **Investigatory project and its submission.**
- **REVISION of whole syllabus and related practicals.**

**❖ Common Pre- Board Examination**

- **REVISION AND BOARD'S PRACTICAL EXAMINATION.**
- **BOARD'S EXAMINATION 2023-24**