



**Delhi Public School, (Joka) South Kolkata**  
**Syllabus for the Year 2022-2023**

**Class- XII**

**Subject- Biology**

**Periodic Assessment –I**

**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; medical termination of pregnancy (MTP); amniocentesis; infertility and assisted reproductive technologies - IVF, ZIFT, GIFT, AI (brief overview).

**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; linkage and crossing over; Sex determination - in human being, birds, grasshopper and honey bee; Mutation, Pedigree analysis, sex linked inheritance - haemophilia, colour blindness; Mendelian disorders in humans – sickle cell anaemia, Phenylketonuria, thalassemia; chromosomal disorders in humans; Down's syndrome, Turner's and Klinefelter's syndromes.

## **Periodic Assessment- II)**

### **Chapter-6: Molecular Basis of Inheritance**

Structure of DNA and RNA; DNA packaging; Search for genetic material and DNA as genetic material; DNA replication; Central Dogma; transcription, genetic code, translation; gene expression and regulation - lac operon; Human genome project; DNA fingerprinting.

### **Chapter-7: Evolution Origin of life**

Biological evolution and evidences for biological evolution (paleontology, comparative anatomy, embryology and molecular evidences); adaptive radiation; Biological evolution: Lamarck's theory of use and disuse of organs, Darwin's 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; brief account of evolution; human evolution.

## **Mid-Term Examination**

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

Genetic Engineering (Recombinant DNA Technology).

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

Application of biotechnology in health and agriculture: genetically modified organisms - Bt crops; RNA interference, Human insulin, gene therapy; molecular diagnosis; transgenic animals; biosafety issues, biopiracy and patents.

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#### **Post Mid-term syllabus**

#### **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, Antibiotics; production and judicious use, sewage treatment, energy generation and microbes as bio-control agents and bio-fertilizers.

### **Chapter-13: Organisms and Populations**

Organisms and environment: Habitat and niche, abiotic factors, ecological adaptations; population interactions - mutualism, competition, predation, parasitism, commensalism; 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 Conservation**

Biodiversity - Concept, levels, 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.

## **Practicals**

### **A. List of Experiments**

1. Prepare a temporary mount to observe pollen germination.
2. Study the plant population density by quadrat method.
3. Study the plant population frequency by quadrat method.
4. Prepare a temporary mount of onion root tip to study mitosis.
5. Isolate DNA from available plant material such as spinach, green pea seeds, papaya, etc.

### **B. Study/observation of the following (Spotting)**

1. Flowers adapted to pollination by different agencies (wind, insects, birds).
2. Pollen germination on stigma through a permanent slide or scanning electron micrograph.
3. Identification of stages of gamete development, i.e., T.S. of testis and T.S. of ovary through permanent slides (from grasshopper/mice).
4. Meiosis in onion bud cell or grasshopper testis through permanent slides.
5. T.S. of blastula through permanent slides (Mammalian).
6. Mendelian inheritance using seeds of different colour/sizes of any plant.

7. 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.
8. Controlled pollination - emasculation, tagging and bagging.
9. Common disease causing organisms like Ascaris, Entamoeba, Plasmodium, any fungus causing ringworm through permanent slides, models or virtual images or specimens. Comment on symptoms of diseases that they cause.
- 10 Models specimen showing symbiotic association in root nodules of leguminous plants, Cuscuta on host, lichens.
11. Flash cards models showing examples of homologous and analogous organs.