(Code No. 044)
Syllabus for 2021-22
CLASS – XII

Term-I

Unit	Content	Marks
VI	Reproduction: Chapter - 2, 3 and 4	15
VII	Genetics and Evolution: Chapter – 5 and 6	20
	Practical	15
	Total	**50**

Term-II

Unit	Content	Marks
VIII	Biology and Human Welfare: Chapter – 8 and 10	14
IX	Biotechnology and its Applications: Chapter – 11 and 12	11
X	Ecology and Environment: Chapter – 13 and 15	10
	Practical	15
	Total	**50**

Term-I

Unit-VI Reproduction

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).

Unit-VII Genetics and Evolution

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.

PRACTICALS

Part-A		
		Marks
One Major Experiment	Experiment No. – 1	04
One Minor Experiment	Experiment No. - 2	03
Part-B		
Spotting (3 Spots of 1 mark each)	B.1, 2, 3, 4, 5	03
Practical Record + Investigatory Project& Record + Viva Voce		05
Total		**15**

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

A. List of Experiments

1. Isolate DNA from available plant material such as spinach, green pea seeds, papaya, etc.
2. Prepare a temporary mount to observe pollen germination.

B. Study/observation of the following (Spotting)

B.1 Flowers adapted to pollination by different agencies (wind, insects, birds).
B.2 Identification of stages of gamete development, i.e., T.S. of testis and T.S. of ovary through permanent slides (from grasshopper/mice).
B.3 Meiosis in onion bud cell or grasshopper testis through permanent slides.
B.4 T.S. of blastula through permanent slides (Mammalian).
B.5 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.

Term-II

Unit-VIII Biology and Human Welfare

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.

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, stem cell technology, 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 attributes - growth, birth rate and death rate, age distribution.

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.

PRACTICALS

Part-A		
		Marks
One Major Experiment	Experiment No. - 3	04
One Minor Experiment	Experiment No. – 4, 5	03
Part-B		
Spotting (3 Spots of 1 mark each)	B.6, 7, 8	03
Practical Record + Investigatory Project& Record + Viva Voce		05
Total		**15**

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

A. List of Experiments

3. Prepare a temporary mount of onion root tip to study mitosis.

4. Collect water from two different water bodies around you and study them for pH, clarity andpresence of any living organism

5. Collect and study soil from at least two different sites and study them for texture, moisturecontent, pH and water holding capacity. Correlate with the kinds of plants found in them.

B. Study/observation of the following (Spotting)

B.6 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.

B.7 Two plants and two animals (models/virtual images) found in xeric conditions. Comment upon their morphological adaptations.

B.8 Two plants and two animals (models/virtual images) found in aquatic conditions. Comment upon their morphological adaptations.

Practical Examination for Visually Impaired Students

Evaluation Scheme

Max. Marks: 15 for each Term

Topic	Marks
Identification/Familiarity with the apparatus	5
Written test (Based on given/prescribed practicals)	5
Practical Records and Viva	5
Total	**15**

General Guidelines

- The practical examination will be of one-hour duration.
- The written examination in practicals for these students will be conducted at the time of practical examination of all other students.
- The written test will be of 30 minutes duration.
- The question paper given to the students should be legibly typed. It should contain a total of 8 practical skill based very short answer type questions. A student would be required to answer any 5 questions.
- A writer may be allowed to such students as per CBSE examination rules.
- All questions included in the question paper should be related to the listed practicals. Every question should require about two minutes to be answered.
- These students are also required to maintain a practical file. A student is expected to record the listed experiments Term -wise as per the specific instructions for each subject. These practicals should be duly checked and signed by the internal examiner.
- The format of writing any experiment in the practical file should include aim, apparatus

required, simple theory, procedure, related practical skills, precautions etc.

- Questions may be generated jointly by the external/internal examiners and used for assessment.
- The viva questions may include questions based on basic theory/principle/concept, apparatus/materials/chemicals required, procedure, precautions, sources of error etc.

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

A. Items for Identification/ familiarity with the apparatus for assessment in practicals (All experiments)

TERM -I:

- Beaker, flask, petri plates, test tubes, aluminium foil, paint brush, bunsen burner/spirit lamp/water bath.
- Starch solution, iodine, ice cubes.
- Developmental stages of frog highlighting morula and blastula.

TERM -II:

- Soil from different sites- sandy, clayey, loamy; Small potted plants, Cactus/*Opuntia* (model), Large flowers, Maize inflorescence.
- Model of *Ascaris*
- **List of**

  Practicals

  TERM -I:

1. Study of flowers adapted to pollination by different agencies (wind, insects).
2. Identification of T.S of Morula or blastula of frog (model).
3. Preparation of pedigree charts of genetic traits such as rolling of tongue, colour blindness.

TERM -II:

4. Study of the soil obtained from at least two different sites for their texture.
5. Identify common disease-causing organisms like *Ascaris (Model)* and learn some common symptoms of the disease that they cause.
6. Comment upon the morphological adaptations of plants found in xerophytic conditions.

Note: The above practicals may be carried out in an experiential manner rather than recording observations.

Prescribed Books:

1. Biology, Class-XII, Published by NCERT.
2. Other related books and manuals brought out by NCERT (including multimedia).
3. Biology Supplementary Material (Revised). Available on CBSE website.