Board of School Education, Haryana

Syllabus and Chapter wise division of Marks (2023-24)

Class-XII **Subject- Biology** **Code: 865**

General Instructions:

1. There will be an Annual Examination based on the entire syllabus.
2. The annual examination (Theory) will be of 70 Marks whereas Practical examinations will be of 30 marks (15 marks each for external and internal examination). Therefore, Total annual evaluation (70+30) will be of 100 marks.

PRACTICALS

Total Time: 3 Hours **Total marks: 30**

Evaluation Scheme	**Marks**
Marks allocated for Internal Examination 1. Student Assessment Test Weightage of marks (04 marks of SAT, 02 marks of half yearly test, 02 marks for preboard test, 02 marks for attendance and classroom participation) 2. Practical file/ Record 3. Project Record	**15** 10 03 02
Marks allocated for External Examination	**15**
Experiments (two)	09 (4.5 marks for each experiment)
Activity (One from Syllabus)	03
Viva Voce (Based on Experiments and Activity)	03
Total marks	**30**

Course Structure (2023-24)

Class-XII **Subject- Biology** **Code: 865**

Sr. No.	Unit	Chapter	Marks
VI	Reproduction	Sexual Reproduction in Flowering Plants	16
		Human Reproduction	
		Reproductive Health	
VII	Genetics and Evolution	Principles of Inheritance and Variation	20
		Molecular Basis of Inheritance	
		Evolution	
VII	Biology and Human Welfare	Human Health and Diseases	12
		Microbes in Human Welfare	
XI	Biotechnology	Biotechnology: Principles and Processes	12
		Biotechnology and its Applications	
X	Ecology	Organisms and Populations	10
		Ecosystem	
		Biodiversity and Conservation	
Total			70
Practical			30
Grand Total			**100**

Unit VI: Reproduction

Chapter 1: Sexual Reproduction in Flowering Plants:

Flower- A Fascinating organ of Angiosperms, **Pre-fertilization: structure and events:** Stamen, microsporangium, and Pollen grain, The Pistil, Megasporangium and Embryo sac, Pollination, **Double fertilization; post fertilisation: structure and events**, Endosperm, Embryo, Seed, **Apomixis and Polyembryony.**

Chapter 2: Human Reproduction

Male Reproductive System, Female Reproductive System, Gametogenesis Menstrual Cycle, Fertilization and Implantation, Pregnancy and Embryonic Development, Parturition and Lactation

Chapter 3: Reproductive Health

Reproductive Health: Problems and Strategies, Population Stabilisation and Birth Control, Medical termination of Pregnancy; Sexually Transmitted Infections (STIs), Infertility.

Unit VII: Genetics and Evolution

Chapter 4: Principles of Inheritance and variation

Mendel's Laws of Inheritance, **Inheritance of One Gene**, Law of Dominance, Law of Segregation, Incomplete dominance, Co-dominance, **Inheritance Of Two Genes**, Law of Independent Assortment, Chromosomal theory of Inheritance, Linkage and Recombination, **Polygenic Inheritance**, **Pleiotropy, Sex Determination:** Sex determination in Human, Honey bee, **Mutation, Genetic Disorders:** Pedigree Analysis, Mendelian Disorders, Chromosomal Disorders.

Chapter 5: Molecular basis of Inheritance

THE DNA: Structure of Polynucleotide chain, Packaging of DNA Helix, **The Search For Genetic Material,** The Genetic Material is DNA,

Properties of Genetic Material (DNA versus RNA), **RNA World, Replication,** The experimental proof, The Machinery and the Enzymes, **Transcription:** Transcription Unit, Transcription Unit and the Gene, Types of RNA and the Process of Transcription, **Genetic Code:** Mutations and Genetic Code, t-RNA-the adapter Molecule, **Translation**, **Regulation of Gene Expression**, the *Lac* Operon, **Human Genome Project,** Salient features of Human Genome, Applications and Future Challenges, **DNA Fingerprinting**.

Chapter 6: Evolution

Origin Of Life, Evolution of Life Forms-A Theory, What are the evidences for Evolution? What is Adaptive radiation? Biological Evolution, Mechanism of Evolution, Hardy-Weinberg Principle, A Brief Account of Evolution, Origin and Evolution of Man.

UNIT VIII: BIOLOGY IN HUMAN WELFARE

Chapter 7: Human Health and Disease

Common Diseases in Humans, **Immunity**, Innate Immunity, Acquired Immunity, Active and passive Immunity, Vaccination and Immunisation, Allergies, Autoimmunity, Immune System in the Body, **AIDS**, **Cancer, Drugs and Alcohol Abuse,** Adolescence and Drug/Alcohol Abuse, Addiction and Dependence, Effects of Drug/Alcohol Abuse, Prevention and Control.

Chapter 8: Microbes in Human Welfare

Microbes in Household Products, Microbes in Industrial Products, Fermented Beverages, Antibiotics, Chemicals, Enzymes and other Bioactive Molecules, **Microbes in Sewage treatment**, **Microbes in Production of Biogas, Microbes as Biocontrol Agents, Microbes as Biofertilizers.**

Unit IX: Biotechnology

Chapter 9: Biotechnology-Principles and Processes

Principles of Biotechnology, **Tools of Recombinant DNA Technology,** Restriction Enzymes, Cloning Vectors, Competent Host (For Transformation with Recombinant DNA), **Processes of Recombinant DNA Technology**, Isolation of Genetic Material (DNA), Cutting of DNA at Specific Locations, Amplification of Gene of Interest using PCR, Insertion of Recombinant DNA into Host cell/Organism, Obtaining the foreign Gene product, Downstream Processing.

Chapter 10: Biotechnology and It's Applications

Biotechnological Applications in Agriculture, **Biotechnological Applications in Medicine,** Genetically Engineered Insulin, Gene therapy, Molecular Diagnosis, **Transgenic animals, Ethical Issues**.

Unit X: Ecology

Chapter 11: Organisms and Populations

Populations, Population Attributes, Population Growth, Life History Variation, Population Interactions.

Chapter 12: Ecosystem:

Ecosystem-Structure and function, Productivity, Decomposition, Energy Flow, Ecological Pyramids.

Chapter 13: Biodiversity and Conservation

Biodiversity, how many species are there on earth and how many in India? Patterns of Biodiversity, The Importance of Species Diversity to the Ecosystem, Loss of Biodiversity, **Biodiversity Conservation**- Why should we conserve Biodiversity? How do we conserve Biodiversity?

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 and observer 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 symbolic association in root modules of leguminous plants, Cuscuta on host, lichens.

11.Flash cards models showing examples of homologous and analogous organs.

Month wise Syllabus Teaching Plan (2023-24)

Class-XII **Subject- Biology** **Code: 865**

Month	Chapter No./ Subject content	Teaching Periods (for theory)	Revision Periods	Teaching Periods (for Practical)
April	Chapter-1: Sexual Reproduction in Flowering Plants Chapter-2: Human Reproduction	12 07	03	08
May	Chapter-3: Reproductive Health	11	02	06
June	**Summer Vacations: Investigatory Project in Biology**			
July	Chapter-4: Principles of Inheritance and Variation Chapter-5: Molecular Basis of Inheritance	12 13	04	12
August	Chapter-6: Evolution Chapter-7: Human health and Diseases	10 08	04	12
September	Chapter-8: Microbes in Human Welfare Half yearly examination	08	10	05
October	Chapter-9: Biotechnology: Principles and processes Chapter-10: Biotechnology and its Applications	13 10	04	12

November	Chapter-10: Biotechnology and its Applications (Remaining content) Chapter-11: Organisms and Populations	11	02	06
December	Chapter-12: Ecosystem	12	03	05
January	Chapter-13: Biodiversity and Conservation	08	03	05
February	Revision			
March	Annual Examination			

Month wise Practical Syllabus

Note: In the following, month wise scheme letter 'A' and 'B' represent Part A (Experiments) and Part B (Spotting) respectively.

April:
A1: Prepare a temporary mount to observe pollen germination.
B1: Flowers adapted to pollination by different agencies (wind, insects, birds).
B2: Pollen germination on stigma through a permanent slide or scanning electron micrograph.

May
B3: Identification of stages of gamete development, i.e., T.S. of testis and T.S. of ovary through permanent slides (from grasshopper/mice).
B4: Meiosis in onion bud cell or grasshopper testis through permanent slides.
B5: T.S. of blastula through permanent slides (Mammalian).

June
Investigatory Project

July
B6: Mendelian inheritance using seeds of different colour/sizes of any plant.

B7: 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.

August

B9: 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.

B11: Flash cards models showing examples of homologous and analogous organs.

September

B10: Models specimen showing symbolic association in root modules of leguminous plants, Cuscuta on host, lichens.

October

A5: Isolate DNA from available plant material such as spinach, green pea seeds, papaya, etc.

November

A2: Study the plant population density by quadrat method.

A3: Study the plant population frequency by quadrat method.

December

A4: Prepare a temporary mount of onion root tip to study mitosis

Note:

- **Subject teachers are advised to direct the students to prepare notebook of the Terminology/Definitional Words used in the chapters for enhancement of vocabulary or clarity of the concept.**
- **The NCERT textbooks present information in boxes across the book. These help students to get conceptual clarity. However, the information in these boxes would not be assessed in the year-end examination.**

Prescribed Books:

1. Biology Class-XII, Published by BSEH © NCERT

QUESTION PAPER DESIGN (2023-24)

Class: 12th **Subject: Biology** **Code: 865**

Type of Question	**Marks**	**Number of Ques.**	**Description**	**Total Marks**
Objective Questions	1 mark each	18	14 Multiple Choice Questions, 4 Assertion-Reason Questions	18
Very Short Answer Type Question	2 marks each	7	Internal choice will be given in any 2 questions	14
Short Answer Type Question	3 marks each	5	Internal choice will be given in any 2 questions	15
Case Study	4 marks each	2	Internal choice will be given only in one part of both questions	8
Long Answer Type Question	5 marks each	3	Internal choice will be given in all the questions	15
Total	**35**		**70**	