BOARD OF SCHOOL EDUCATION HARYANA

Syllabus and Chapter wise division of Marks (2024-25)

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 examination will be of 30 marks (15 marks each for external and internal examination). Therefore, Total annual evaluation (70+30) will be of 100 marks.
3. For Practical examination the criteria is as follows:

   Total Time: 3 Hours

PRACTICALS

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

Evaluation Scheme	**Marks**
Marks allocated for Internal Assessment 1. Student Assessment Test Weightage of marks (04 marks of SAT, 02 marks of half yearly test, 02 marks for preboard, 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 (2024-25)

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	
VIII	Biology in Human Welfare	Human Health and Diseases	12
		Microbes in Human Welfare	
IX	Biotechnology	Biotechnology: Principles and Processes	12
		Biotechnology and its Applications	
X	Ecology	Organism and Populations	10
		Ecosystem	
		Biodiversity and its 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

The Male Reproductive System, **The 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, 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:

1. Study the reproductive parts of commonly available flowers.
2. Study pollen tube growth on stigma.
3. Study the discrete stages of gametogenesis in mammalian testis and ovary.
4. Study of stages of meiosis using permanent slides.
5. Study the blastula stage of embryonic development in mammals.
6. Verify the Mendel's Law of Independent Assortment.
7. Preparation and analysis of Pedigree Charts.
8. Staining of nucleic acid by acetocarmine.
9. Study of homologous and analogous organs in plants and animals.
10. Identify common disease-causing organisms and the symptoms of the diseases.
11. Study plant population density by quadrat method.
12. Study plant population frequency by quadrat method.

Month wise Syllabus Teaching Plan (2024-25)

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

Month	Chapter No./ Subject content	Teaching Periods	Revision Periods	Practical Periods
April	Chapter-1: Sexual Reproduction in Flowering Plants	18	04	
	Practical: Study the reproductive parts of commonly available flowers.			03
	Practical: Study pollen tube growth on stigma.			03
May	Chapter-2: Human Reproduction	14	02	
	Practical: Study the discrete stages of gametogenesis in mammalian testis and ovary.			02
	Practical: Study of stages of meiosis using permanent slides.			02
	Practical: Study the blastula stage of embryonic development in mammals.			01
	Chapter-3: Reproductive Health	06	01	

June	**Summer Vacations: Investigatory Project in Biology**			
July	Chapter-4: Principles of Inheritance and Variation Practical: Verify the Mendel's Law of Independent Assortment. Practical: Preparation and analysis of Pedigree Charts.	20	04	 02 04
August	Chapter-5: Molecular Basis of Inheritance Practical: Staining of nucleic acid by acetocarmine. Chapter-6: Evolution Practical: Study of homologous and analogous organs in plants and animals.	20 10	04 02	 02 02
September	Chapter-7: Human health and Diseases Practical: Identify common disease-causing organisms and the symptoms of the diseases. Revision Half yearly examination	10	02 10	 04

October	Chapter-8: Microbes in Human Welfare Chapter-9: Biotechnology: Principles and processes Chapter-10: Biotechnology and its Applications	08 10 06	02 02 02	
November	Chapter-11: Organisms and Populations Practical: Study the plant population density by quadrat method. Practical: Study the plant population frequency by quadrat method.	12	02	03 03
December	Chapter-12: Ecosystem Chapter-13: Biodiversity and Conservation	10 10	02 02	
January	Revision		20	
March	Annual Examinations			

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 concepts.**
- **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, BSEH Publications © NCERT
2. Laboratory Manual: Biology, Class XII, NCERT Publications
3. Exemplar Problems, Class XII, NCERT Publications

QUESTION PAPER DESIGN (2024-25)

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

Time Allowed: 3

Type of Questions	Marks	Number of Questions	Description	Total Marks
Objective Type Questions	1 mark each	18	09 Multiple Choice Questions 03 Fill in the blanks 03 One-word answers 03 Assertion Reason type Questions	18
Very Short Answer Type Questions	2 marks each	7	Internal Choice will be given in any 3 questions	14
Short Answer Type Questions	3 marks each	5	Internal Choice will be given in any 2 questions	15
Case Study Based Questions	4 marks each	2	Internal Choice will be given only in one part of both questions	8
Long Answer Type Questions	5 marks each	3	Internal Choice will be given in all questions	15
TOTAL		**35**		**70**