BIOLOGICAL SCIENCES (BIOS)

CLASS - XII

FULL MARKS- 100

THEORY – 70 MARKS

Unit – I	REPRODUCTION IN ORGANISMS	14 MARKS
Unit – II	GENETICS AND EVOLUTION	18 MARKS
Unit – III	BIOLOGY AND HUMAN WELFARE	14 MARKS
Unit – IV	BIOTECHNOLOGY AND ITS APPLICATION	10 MARKS
Unit – V	ECOLOGY AND ENVIRONMENT	14 MARKS

Unit – I REPRODUCTION IN ORGANISMS

1 : Sexual Reproduction In flowering Plants

1.1 Flower structure: Typical structure of a complete regular flower with diagram

1.2 Pollination: Definition, types-self Pollination (autogamy and geitonogamy) And cross pollination. (allogamy and xenogamy); agents of pollination- wind, water, animals, insects and birds- brief description with example. Significance.

1.3 Outbreeding devices

1.4 Double fertization

1.5 Special modes – apomixes, Parthenogenesis, parthenocarpy and Polyembryony (brief account)

1.6 Significance of seed and fruit formation

2 : Human Reproduction

2.1 Introduction

2.2 Male Reproductive system (outline with diagram)

2.3 Female Reproductive system (outline with diagram)

2.4 Gametogenesis- Definition and type

2.5 Spermatogenesis (brief account)

2.6 Oogenesis (brief account)

2.7 Menstrual cycle

2.8 Fertilization and development of embryo upto blastocyst formation and implantation.

2.9 Pregnancy and Placenta formation (elementary idea)

2.10 Parturition (elementary idea)

1.11 Lactation (elementary idea)

3 : Reproductive Health

3.1 Introduction: what is Reproductive health?

3.2 Need for reproductive health

3.3 Sexually Transmitted diseases (STD) And its prevention

3.4 Birth control- Needs and Methods:
- I) Contraception
- ii) Medical termination of pregnancy (MTP)

3.5 Amniocentesis: What it is and it's Significance

3.6 Infertility and assisted reproductive Technologies – IVF (in vitro fertilization), ZIFT (Zygote intrafallopian transfer), GIFT (Gamete intrafallopian transfer) Elementary idea for general awareness.

Unit – II GENETICS AND EVOLUTION

4. Heredity and Variation

4.1 Introduction

4.2 Mendelian Inheritance (laws only)

4.3 Deviations from Mendelism
- i) incomplete dominance
- ii) Co-dominance
- iii) multiple alleles and Inheritance of Blood groups (ABO & Rh)
- iv) Pleiotroph

4.4 Polygenic inheritance (elementary)

4.5 Chromosome theory of inheritance

4.6 Chromosome and genes

4.7 Sex determination in – Human, bird and honey bee

4.8 Linkage and crossing over

4.9 Sex –linked inheritance – haemophillia and colour blindness

4.10 Mendelian disorder in human: Chromosomal disorders:
- i) Autosomal – thalassemia
- ii) Sex-linked-Down's Syndrome, Turner's Syndrome and Klinefelter's Syndrome (cause & symptoms only , Process of inheritance is not required)

5 : Molecular Basic of Inheritance

5.1 Search for genetic material
5.2 DNA as genetic material:
(experiments on Bacterial transformation by F. Griffith; Avery ,McLeod and Harshey & Chase)
5.3 Structure of DNA
5.4 Structure of RNA
5.5 Types of RNA –mRNA; rRNA & tRNA
5.6 DNA Packaging
5.7 Central dogma (elementary), DNA replication , transcription. Genetic code and translation .
5.8 Regulation of Gene expression (elementary) Lac Operon
5.9 Genome and Human genome project
5.10 DNA finger printing

6 : Evolution

6.1 Introduction
6.2 Biological Evolution
a) What is biological Evolution?
b) Evidence for Biological Evolution
i) Paleonotological
ii) From comparative anatomy
iii) Embryological
iv) Molecular
6.3 Theories of organic evolution
Introduction – Darwin's contribution- Modern Synthetic Theory – Hardy Weinberg's Principle

Unit – III BIOLOGY AND HUMAN WELFARE

7 : Health and Diseases

7.1 Basic concept of immunology – vaccines
Introduction – immune system – Antigen, Antibody , Antigen-Antibody reaction – Types of immunity – vaccines and vaccination
7.2 Pathogens, parasites causing human Diseases-Malaria, Filariasis, Ascariasis, Typhoid, Pneumonia, common cold , Amoebiosis and ring worm .(symptoms of Disease, Name of causative agent ,mode of Transmission ,preventive measures)

7.3 Cancer ,HIV and AIDS-Symptoms of disease , causative agent , mode of transmission preventive measures

7.4 Adolescene : drug and alcohol abuse

8 : Microbes In Human welfare

8.1 In household food processing

8.2 Industrial production

8. 3 Sewage treatment

8. 4 Energy generation

8 .5 Bio control agents and bio fertilizers

Unit – IV BIOTECHNOLOGY AND ITS APPLICATION

9 : Biotechnology and its Application

9.1 Introduction

9.2 Principle

9.3 Process –Genetic Engineering (Recombinant DNA technology)

9.4 Application of Biotechnology in health and agriculture – introduction

9.5 Human insulin and vaccine production- gene therapy

9.6 Gentically modified organisms - BT crops (What is G.M.O ? example- cotton). Transgenic animals.

9.7 Bio safety issues

9.8 Bio piracy and patents

Unit – V ECOLOGY AND ENVIRONMENT

10 : Ecology Environment & Population

10.1 Meaning of ecology. Environment , Habitat and niche.

10.2 Organisms and environment

i) Introduction –biome concept and distribution

ii) Major abdiotic factors – water ,light temperature and soil

iii) Responses to abiotic factors

iv) Adaptations

10.3 Population and ecological adaptations-

i) Population interactions – mutualism

competition, predation, parasitism

ii) Population attributes- growth, birth rate and death rate , age distribution

11 : Biodiversity And Conservation

11.1 What is biodiversity?

11.2 Levels of biodiversity (genetic , species and Ecological) Patterns of biodiversity
Importance and loss of biodiversity

11.3 Threats to need for biodiversity conservation

11.4 Hotspots ,endangered organisms, extinction ,Red Data book

11.5 Biodiversity conservation –
a) Biosphere reserve
b) National parks and sanctuaries-

12 : Environment issues

12.1 Introduction

12.2 Air Pollution and its control

12.3 Water Pollution and its control

12.4 Agro -Chemicals and their effects

12.5 Solid waste management

12.6 Radioactive waste management

12.7 Green House effect and global warming

12.8 Ozone depletion

12.9 Deforestation

12.10 Three success stories addressing environmental issue – chipko movement, Dasholi Gram Swarajya Mandal (DGSM) Movement ;Silent valley or Amrita Devi-Bishnoi (Jaipur) movements

BIOLOGICAL SCIENCES (BIOS)

Class – XII

(New Syllabus)

QUESTION PATTERN

(THEORY)

- Marks Distribution :

Sl. No.	Unit	(1 mark) Sec-I MCQ	(1 mark) Sec-II VSA	(2 marks) Sec-II SA-I	(3 marks) Sec-II SA-II	(5 marks) Sec-II LA	Tota
1.	Reproduction	3(3)	1(1)	2(1)	3(1)	5(1)	14
2.	Genetics & Evolution	4(4)	1(1)	2(1)	6(2)	5(1)	18
3.	Biology in Human Welfare	2(2)	1(1)	2(1)	9(3)	—	14
4.	Bio-Technology	2(2)	—	2(1)	6(2)	—	10
5.	Ecology & Environment	3(3)	1(1)	2(1)	3(1)	5(1)	14
		14(14)	4(4)	10(5)	27(9)	15(3)	70

- Question Paper will have two Sections :
  Section-I : For MCQ (Question Nos. 1 to 14)
  Section-II will have four groups :
  VSA (1 mark) — one sentence answer (Question Nos. 1-4)
  SA-I (2 marks) — (Question Nos. 5-9)
  SA-II (3 marks) — (Question Nos. 10-18)
  LA (5 marks) — (Question Nos. 19-21)
- There should be no fractions in the marks distribution.
- For SA-I, marks may be divided into 1 + 1
- For SA-II, marks may be divided into 2 + 1
- For LA, marks may be divided into 3 + 2 or 4 + 1.
- Option Summary :

Section I	No internal option
Section-II VSA	Internal options for at least any 2 questions
Section-II SA-I	Internal options for at least any 3 questions
Section-II SA-II	Internal options for at least any 5 questions
Section-II LA	Internal options for at least any 2 questions