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FOR MANIPUR CLASS 12 PREPARATION

Manipur Board Class 12 Syllabus 2027 Biology

EXAM	YEAR	TYPE	SUBJECT
Manipur Class 12	2027	Syllabus	Biology

BIOLOGY

THEORY

COURSE STRUCTURE

CLASS-XII

One Paper **Time : 3 Hours** **70 Marks**

Unit	Title	Marks
VI.	Reproduction in Organisms	14
VII.	Genetics and Evolution	18
VIII.	Biology and Human welfare	14
IX.	Biotechnology	10
X.	Ecology	14
	Total =	**70**

UNIT VI: Reproduction (35 periods)

Chapter 2: Sexual Reproduction in flowering Plants

Flower; Pre-fertilisation: Structures and Events; Pollination-types, agencies and examples; Outbreeding devices; Pollen-pistil interaction; Double fertilization; Post fertilisation: structures and Events; Development of endosperm & embryo; Development of seed and formation of seed; Fruit formation; Parthenocarpy, apomixis and polyembryony.

Chapter 3: Human Reproduction

Male andfemale Reproductive systems; Gametogenesis-spermatogenesis & oogenesis; Menstrual cycle; Fertilization and Implantation; Pregnancy and Embryonic development; Parturition and Lactation.

Chapter 4: Reproductive Health

Reproductive Health – problems and strategies; Population Explosion and Birth control; Medical termination of Pregnancy; Sexually Transmitted Diseases; Infertility and Assisted reproductive technologies- assisted reproductive technologies - IVF, ZIFT, GIFT (elementary idea for general awareness).

UNIT VII: Genetics and Evolution (45 Periods)

Chapter 5: Principles of Inheritance and Variation

Mendel's Laws of Inheritance; Deviations from Mendelism: Incomplete dominance, Co-dominance, Multiple allelism; Chromosomal theory of Inheritance; Linkage and Recombination; Polygenic Inheritance; Pleiotropy; Sex

Determination- in birds, humans and honey bee; Mutation; Pedigree analysis; Genetic Disorders: Mendelian disorders –Colour blindness,Haemophilia,sickle-cell anaemia, phenylketonuria, Thalassemia; Chromosomal Disorders – Down's syndrome, klinefelter's syndrome, Turner's syndrome.

Chapter 6: Molecular Basis of Inheritance
Structure of DNA and RNA; Packaging of DNA; The search for genetic material; RNA world; DNA Replication; Transcription; Genetic code; Translation; Regulation of Gene Expression; Human genome Project; DNA fingerprinting.

Chapter 7: Evolution
Origin of Life; Evolution of Life Forms; Evidences for Evolution; 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 **(35 Periods)**

Chapter 8: Human Health and Disease
Common Diseases in Humans (typhoid, pneumonia, commoncold, malaria, amoebiasis, ascariasis, filariasis, ring worm);
Immunity (Innate, Acquired, Active and passive Immunity, Vaccination and Immunisation, Allergy, Auto Immunity); Immune System in the body;
AIDS, Cancer, Drugs and Alcohol Abuse.

Chapter 10: Microbes in Human welfare
Microbes in Household Products, Industrial Products,Sewage Treatment, and Production of biogas;
Microbes as Biocontrol agents and Biofertilisers.

UNIT IX: BIOTECHNOLOGY **(30 Periods)**

Chapter 11: Biotechnology: Principles and Processes
Principles of Biotechnology; Tools of Recombinant DNA Technology; Process of Recombinant DNA Technology.

Chapter 12: Biotechnology and Its Application
Biotechnological Applications in agriculture (GMO and Bt cotton) and medicine (genetically engineered insulin, gene therapy, molecular diagnosis);
Transgenic animals; Ethical Issues.

UNIT X: ECOLOGY (35 periods)

Chapter 13: Organisms and Populations

Populations: Population Attributes; Population Growth, Life history variation; Population Interactions – Predation, Competition, Parasitism, Commenselism and Mutualism.

Chapter 14: Ecosystem

Structure and Function; Productivity; Decomposition; Energy Flow; Ecological Pyramids;

Chapter 15: Biodiversity and Conservation

Biodiversity: Patterns of Biodiversity; Importance of Species diversity to the Ecosystem; Loss of Biodiversity; Biodiversity Conservation.

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BIOLOGY

PRACTICAL

CLASS-XII

Time : 3 Hours **Marks : 30** **Periods : 60**

1.	Experiments and spotting	20 Marks
2.	Record of one investigatory project and Viva based on the project	5 Marks
3.	Class record and Viva based on experiment.	5 Marks
	Total =	**30 Marks**

A. List of Experiments

1. Study of pollen germination on a slide.
2. Collect water from two different water bodies around you and study them for pH, clarity and presence of any living organisms.
3. Study of plant population density by quadrat method.
4. Study of plant population frequency by quadrat method.
5. Prepare a temporary mount of onion root tip to study mitosis.

B. Study/observation of the following (Spotting)

1. Flowers adapted to pollination by different agencies (wind, insects).
2. Pollen germination on stigma through a permanent slide.
3. Identification of stages of gamete development i.e. T.S. testis and T.S. ovary through permanent slide. (from any mammal)
4. Meiosis in onion bud cell or grasshopper testis through permanent slide.
5. T.S. of blastula through permanent slide.
6. Mendelian inheritance using seeds of different colour/size of any plant.
7. Prepared pediqree charts of genetic traits such as rolling of tongue, blood groups, widow's peak, colour blindness.
8. Exercise on controlled pollination–Emasculation, tagging and bagging.
9. Identification of common disease causing organism like *Ascaris*, *Entamoeba, Plasmodium*, Ringworm through permanent slides or specimens. Comment on symptoms of diseases that they cause.
10. Two plants and two animals found in xerophytic conditions. Comment upon their morphological adaptations.
11. Plants and animals found in aquatic conditions. Comment upon their morphological adaptations.

PRESCRIBED TEXTBOOKS : CLASS XII

1. Biology
   Textbook for Class XII.
   Published by : NCERT, New Delhi.

REFERENCE BOOKS :

1. Elementary Biology Vol. II
   By : K.N. Bhatia and M.P. Tyagi
   Published by : Trueman Book Company, Jalandhar - 144 008.

2. Companion Biology for Class XII
   By : K. Bhatti.
   Published by : S. Dinesh & Co. Jalandhar-144008.

3. Saraswati Lab Manual Biology for Class-XI I (NCF 2023 Aligned)
   By: Rajesh Kumar Srivastav
   Published by: New Saraswati House (India) Private Limited, New Delhi-110002

3. Comprehensive Laboratory Manual in Biology for Class XII (New Edition)
   By : Dr. J.P. Sharma
   Published by : Laxmi Publications (P) Ltd., New Delhi - 110 002.

4. A Textbook of Practical Biology for Class-XII
   By : Dr. N. Mohendra Singh
   Published by : Writers' Book Store, Pologround, Imphal.

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DESIGN OF QUESTION PAPER

Subject : **BIOLOGY**
Paper : Theory
Class : XII
Full Mark : 70
Time : 3 Hours

I	**WEIGHTAGE TO OBJECTIVES:**				
	Objectives			**Marks**	**Percentage**
	Knowledge(K)			10	15
	Understanding (U)			35	50
	Application (A)			21	30
	Skill (S)			4	5
			Total:	**70**	**100**
II	**WEIGHTAGE TO FORMS OF QUESTIONS:**				
	FORM OF QUESTIONS	**No. of questions**	**Time(in minutes)**	**Marks**	**Percentage**
	Essay/Long Answer (E/LA)	3	60	15	21
	Short Answer (SA-I)	6	37	18	26
	Short Answer (SA-II)	10	40	20	29
	Very Short Answer(VSA)	7	21	7	10
	MCQ	10	22	10	14
	Total:	**36**	**180**	**70**	**100**
III	**WEIGHTAGE TO CONTENT:**				
	Unit	**CONTENTS**		**Marks**	**Percentage**
	I	Reproduction in Organisms		14	20
	II	Genetics and Evolution		18	26
	III	Biology and Human Welfare		14	20
	IV	Biotechnology		10	14
	V	Ecology		14	20
			Total:	**70**	**100**
IV	**SCHEME OF SECTIONS:**		**NIL**		
V	**SCHEME OF OPTIONS: :**	**i) Internal option will be given in Essay Type Question** **ii) Internal option will be given in three questions of SA-I including one case study based question.**			
VI	**DIFFICULTY LEVEL :** Difficult : 35% of the total marks Average : 50% of the total marks Easy : 15% of the total marks				

Abbreviation: K(Knowledge), U(Understanding), A(Application),S(Skill), E/LA(Essay Type/Long Answer Type), SA(Short Answer Type), VSA(Very Short Answer Type), O(Objective Type).
MCQ (Multiple Choice Question).

N.B.: Assertion and reasoning: 2(two) Questions in MCQ.
Source Based Question: 1(one) Question in SA-I

DESIGN
QUESTION PAPER/UNIT TEST

Subject : BIOLOGY
Unit/Paper : Practical
Class : XII
Time : 3 Hours
Full Marks : 30

MARKING SCHEME :

Section - A **4 Marks**

Q. 1

(a) Item 1 : Pollen germination.

(i)	Slide Preparation	–	1
(ii)	Observations	–	1
(iii)	Diagram and labelling	–	1
(iv)	Comments	–	1
		Total =	**4**

(b) Item 5 : Preparation of temporary slide of mitosis in Onion root tip cells.

(i)	Preparation of slide	–	2
(ii)	Labelled diagram	–	1
(iii)	Description	–	1
		Total =	**4**

Section - B **4+4 = 8 Marks**

Q.2

(a) Item 2 : Soil test, pH and water holding capacity, pH clarity and presence of any living organisms and presence of suspended particulate matter in air.

(i)	Experimentation/Setting of experiment	–	1
(ii)	Observations	–	1
(iii)	Inference and Result	–	2
		Total =	**4**

(b) Item 3 & 4 : **Quadrate Method :** Plant population density and plant population frequency

(i)	Setting of Field experiment	–	1
(ii)	Identification of Species	–	1
(iii)	Data and Comments	–	1+1
		Total =	**4**

Section - C (Two spots each from plants and animals) 2x4=8 Marks

Q. 3

Item 1-11: Spotting

(i)	Identification	–	1
(ii)	Comment	–	1
		Total =	**2**

Section - D

Q. 4 Investigatory Project **5 Marks**

(i)	Aim and object	–	1
(ii)	Materials and Methods	–	1
(iii)	Summary of the project	–	1
(iv)	Viva Voce on project record	–	2
		Total =	**5**

Q. 5 Laboratory Record Book **5 Marks**

(i)	Completeness of practical work	–	1
(ii)	Regularity in Submitting record	–	1
(iii)	Neatness and accuracy of record	–	1
(iv)	Viva Voce on laboratory record	–	2
		Total =	**5**

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