

BIOLOGY

Theory Paper	Time : 3 Hours	Max. Marks: 70
Practical Paper	Time : 3 Hours	Max. Marks 30
		Total Marks : 100

THEORY

STRUCTURE OF QUESTION PAPER

1. There will be one theory paper comprising of 30 questions. All questions will be compulsory.
2. Marks for each question are indicated against it.
3. Q Nos. 1-10 are very short answer type questions carrying 1 mark each. Answer to each question will be in one line or few words only.
4. Q.Nos. 11-18 are short answer type questions carrying 2 marks each. Answer to each question will be in 20 to 30 words.
5. Q. No. 19-26 are short answer type questions carrying 3 marks each. Answer to each question will be in 40 to 50 words.
6. Q. No. 27 to 30 are long answer type questions carrying 5 marks each. Answer to each question will be in 80 to 100 words.
7. In Q. No. 27 to 30, there will be 100% internal choice.
8. Distribution of marks to cover different dimensions of question paper will be as under:

Learning outcomes	Marks	Percentage of Marks
i) Knowledge	20	29%
ii) Understanding	30	42%
iii) Application	20	29%
9. There will be no objective type questions such as 'yes/no', tick/cross', fill in the blanks multiple choice, true/false etc.
10. The question paper should be strictly from the prescribed syllabus based in above mentioned guidelines.

The unit wise distribution of marks will be as follows:

Unit - I	Sexual Reproduction	12 Marks
Unit - II	Genetics and Evolution	20 Marks

Unit - III	Biology and Human Welfare	12 Marks
Unit -IV	Biotechnology and Its Applications	12 Marks
Unit - V	Ecology and Environment	14 Marks

Unit I : Sexual Reproduction

Pollination and fertilization in flowering plants.

Development of seeds and fruits.

Human reproduction : reproductive system in male and female, menstrual cycle, production of gametes, fertilization,implantation, embryo development, pregnancy and parturition.

Reproductive health:birth control, contraception and sexually transmitted diseases.

Unit II : Genetics and Evolution

Mendelian inheritance.

Chromosome theory of inheritance, deviations from Mendelian ratio (gene interaction-incomplete dominance, co-dominance, complementary genes, multiple alleles).

Sex determination in human beings : XX, XY.

Linkage and crossing over.

Inheritance pattern of haemophilia and blood groups in human beings.

DNA: replication, transcription, translation.

Gene expression and regulation.

Genome and Human Genome Project.

DNA fingerprinting.

Evolution : Theories and evidences.

Unit III Biology and Human Welfare

Animal husbandry.

Basic concepts of immunology, vaccines.

Pathogens and parasites.

Plant breeding, tissue culture, food production.

Microbes in household food processing, industrial production, sewage treatment and energy generation.

Cancer and AIDS.

Adolescence, drugs and alcohol abuse.

Unit IV Biotechnology and Its Applications

Recombinant DNA technology.

Applications in Health, Agriculture and Industry.

Genetically modified (GM) organisms; biosafety issues.

Insulin and Bt cotton.

Unit V Ecology and Environment

Ecosystems components, types and energy flow.

Species, population and community.

Ecological adaptations.

Centers of diversity and conservation of biodiversity, National Parks and Wild Life Sanctuaries.

Environmental issues.

PRACTICAL

One Practical Paper

Time : 3 Hours

Max. Marks 30

STRUCTURE OF QUESTION PAPER

Distribution of marks.

1. Two experiments four marks each	4 + 4 Marks	8 Marks
2. Two slide indentification with reasons	2 + 2 Marks	4 Marks
3. Spotting of two animals and two plants. Comment upon their adaptations		8 Marks
4. Investigatory project and Viva based on the project		5 Marks
5. Record and Viva based on the experiments		5 Marks

Note :

1. The maximum number of students to be examined by the practical examiner should not be more than 20 students per group.
2. The project report duly signed by the teacher should be kept in record and sent to the board on demand.

SYLLABUS

List of Experiments :

1. Study of pollen grain on a slide.
2. Collect and study soil from different sites and study them for texture and moisture content.
3. Study the pH and Water holding capacity of soil. Correlate with the kinds of plants found in them.
4. Collect water from different water bodies around you and study them for pH clarity and presence of any living organisms.
5. Study the presence of suspended particulate matter in air at the two widely different sites.
6. Study of plant population density by quadrat method.
7. Study of plant population frequency by quadrat method.
8. Study of flowers adapted to pollination by different agencies (wind, insect).
9. Study of pollen germination on a slide.
10. Study and identify stages of gamete development i.e. T.S. of testis and T.S. of ovary through permanent slide.
11. Study meiosis in onion bud cell or grasshopper testis through permanent slide.

12. Study of T.S. of blastula through permanent slide.
13. Study mendelian inheritance using seeds of different colour/size of any plant.
14. Study prepared pedigree charts of genetic traits such as rolling of tongue, blood groups, widow's peak, colour blindness.
15. Exercise on controlled pollination-Emasculation, tagging and bagging.
16. To identify common diseases causing organisms like Ascaris, Entamoeba, Plasmodium, ringworm. Comment on symptoms of diseases that they cause through permanent slides or specimens.
17. Study plants and animals found in xerophyte conditions. Comment upon their adaptation ecosystem.
18. Study plants and animals found in aquatic conditions. Comment upon their adaptation ecosystem.
19. Study analogous and homologous organs in various plants and animals.

Note:

Any one project based on practical mentioned above and the teacher have the freedom to suggest any subject related project.