

BIOLOGY PAPER – 1

(THEORY)

(Maximum Marks: 70)

(Time allowed: Three hours)

*(Candidates are allowed additional 15 minutes for only reading the paper.
They must NOT start writing during this time.)*

Class: XII

This paper comprises TWO PARTS – Part I and Part II.

Answer all questions.

Part I consists of one question of 20 marks having five subparts.

Part II consists of Sections A, B and C.

Section A consists of seven questions of two marks each.

Section B consists of seven questions of three marks each, and

Section C consists of three questions of five marks each.

Internal choices have been provided in two questions in Section A, two questions in Section B and in all three questions of Section C.

The intended marks for questions or parts of questions are given in brackets [].

PART I (20 Marks)

Answer all questions.

Question 1

(a) Answer the following questions briefly and to the point: **[8×1]**

(i) Name two conventions on biological diversity.

(ii) Define GPP

(iii) Why are plants raised through micropropagation termed as somaclones?

(iv) Name the group of organism and the substrate they act on to produce biogas

(v) If 8 individuals in a laboratory population of 80 fruit flies died in a week, then what would be the death rate for population for the said period?

(vi) Differentiate between Cannabinoids and Barbiturates.

(vii) If the sequence of one strand of DNA is written as follows.

5'-ATGCATGCATGCATGC-3'

Write down the sequence of complementary strand in 3'--- 5' direction.

(viii) What is central dogma?

(b) Each of the following sub-parts, (1) to (4) has four choices. Choose the best option in each case: [4x1]

(i) If 40 J energy is trapped at producer level, then what amount of energy will be available to hawk

Plant----- Caterpillar----- Sparrow----- Hawk

(1) 0.0004J

(2) 0.04J

(3) 4J

(4) 0.004J

(ii) In seven pairs of contrasting characters in pea plant studied by Mendel, the number of flower based characters are

(1) One

(2) Two

(3) Three

(4) Four

(iii) Darwin finches is a very good example of

(1) Adaptive radiation

(2) Convergent evolution

(3) Parallel evolution

(4) Analogous Organ

(iv) The genotype of a person with Turner's syndrome will be

(1) 44 +XXY

(2) 44+XYY

(3) 44+XO

(4) 44+XXYY

(c) Name the scientists who have contributed to the following

[4×1/2]

- (i) Isolated nucleic acid from pus cells, called nuclein
- (ii) Reverse transcription
- (iii) Proposed the recapitulation theory
- (iv) Chromosomal mapping

(d) Expand the following

[4×1/2]

- (i) DDT
- (ii) IRRI
- (iii) NACO
- (iv) ISCI

(e) Define the following:

[2×1]

- (i) Double fertilization
- (ii) Introns

(f) Give a reason for each of the following:

[2×1]

- (i) Certain regions have been declared as biodiversity hotspots by environmentalists of the world.
- (ii) Fossils are the written documents of evolution.

PART II

SECTION A (14 Marks)

(Answer all questions)

Question 2

[2]

What is integrated pest management?

Question 3

[2]

Discuss the various In-situ strategies for conservation of biodiversity.

Question 4

[2]

(a) Give the significance of transgenic animals.

OR

(b) List four applications of tissue culture.

Question 5

[2]

What is Montreal Protocol? What is its objective?

Question 6

[2]

(a) Draw a well labelled diagram of t RNA.

OR

(b) Draw a well labelled diagram of an antibody molecule.

Question 7

[2]

Mention one symptom of Elephantiasis. Name its causative agent.

Question 8

[2]

Differentiate between B cells and T cells.

SECTION B (21 Marks)

(Answer all questions)

Question 9

[3]

(a) Discuss the development of an angiospermic ovule

OR

(b) Explain Pleiotropy with reference to phenylketonuria

Question 10

[3]

Draw a diagram showing pBR 322. Why is it considered a good cloning vector?

Question 11

[3]

Explain the steps in plant breeding.

Question 12

[3]

Explain polygenic inheritance in humans.

Question 13

[3]

Define:

- (i) Mutualism
- (ii) Commensalism
- (iii) Brood Parasitism.

Compare J-shaped pattern with S-shaped pattern of population growth.

Question 14

Name and define the three types of natural selection.

[3]

Question 15

Describe the Urey and Miller experiment on the origin of life.

[3]

SECTION C (15 Marks)

(Answer all questions)

Question 16

(a) (i) How has biotechnology been useful in controlling nematode infection in plants? Explain the technique involved in this process.

(ii) Name the source of cyclosporin- A. What is the use of this bioactive molecule?

OR

(b) (i) Explain the different steps of xerarch succession occurring in nature.

(ii) Differentiate between primary and secondary ecological successions.

[5]

Question 17

(a) (i) Explain how insulin can be produced using r DNA technology

(ii) Discuss the events leading to fertilisation in plants.

OR

(b) (i) Explain the events taking place at the time of fertilisation of an ovum in a human female.

(ii) Trace the development of the zygote up to its implantation in the uterus.

(iii) Name and draw a labelled section view of the embryonic stage that gets implanted.

[5]

Question 18

(a) (i) Explain the Lac operon concept

(ii) Why was protein coat of bacteriophage not considered to be the hereditary material?

OR

(b) (i) Explain protein synthesis with respect to initiation, elongation and termination.

(ii) What are VNTR?

[5]