

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)

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

*Answer **all** questions.*

Part I contains twenty questions of one mark each.

Part II consists of Section A, B & C.

*Section A contains **seven** questions of **two** marks each*

*Section B contains **seven** questions of **three** marks each, and*

*Section C contains **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.

PART I (20 Marks)

*Answer **all** questions.*

Question 1

- (a) Answer the following questions briefly and to the point: **[8×1]**
- (i) Name the most common motile spore of fungi.
 - (ii) State the chromosome number in the endosperm of onion.
 - (iii) Give the use of *test cross*.
 - (iv) Mention the use of *Lactobacillus*.
 - (v) What will happen if a child does not get colostrum in his early childhood?
 - (vi) What is the shape of the pyramid of number in a single tree ecosystem?
 - (vii) What is the biological significance of golden rice production?
 - (viii) *Bt crops are resistant to pests*. Name the gene responsible for pest resistance.

(b) Each of the following questions has four choices. Choose the best option in each case: **[4×1]**

(i) Capacitation refers to the process of changes in the:

- (1) Testis
- (2) Sperm
- (3) Ovary
- (4) Ovum

(ii) MTP is considered to be safe up to how many weeks of pregnancy?

- (1) Six
- (2) Eight
- (3) Twelve
- (4) Eighteen

(iii) Which of the following is a vestigial organ in humans?

- (1) Pinna
- (2) Coccyx
- (3) Tail
- (4) Molars

(iv) Secondary sewage treatment is mainly a:

- (1) Chemical process
- (2) Biological process
- (3) Mechanical process
- (4) Physical process

(c) Give one significant contribution of each of the following scientists: **[4×1]**

- (i) Gamow
- (ii) Chargaff
- (iii) T.H. Morgan
- (iv) Alec Jeffery

(d) Define the following: **[2×1]**

- (i) Life span
- (ii) Natality

- (e) Give reason: [2×1]
- (i) Retrovirus is considered to be an exception to the central dogma.
- (ii) The rate of Ozone depletion is greater in Antarctica.

PART II

SECTION A (14 Marks)

(Answer **all** questions)

Question 2 [2]

- (a) Draw a labelled diagram of human ovum.

OR

- (b) Draw a labelled diagram of human sperm.

Question 3 [2]

If phenotype of father is blood group 'O' and genotype of mother is heterozygous 'A', what are the possible genotypes and phenotypes of the offspring?

Question 4 [2]

Mention *four* features of pBR₃₂₂.

Question 5 [2]

State four measures taken by the government to control high level of air pollution in cities.

Question 6 [2]

In recent years, there has been large scale loss of biodiversity. Mention *four* ways in which humans are responsible for it.

Question 7 [2]

Mention *any one* symptom of elephantiasis. Name its causative agent.

Question 8 [2]

- (a) Mention any two properties of DNA that make it an ideal genetic material.

OR

- (b) Give *two* differences between Darwinism and the theory of mutation.

SECTION B (21 Marks)

(Answer *all* questions)

Question 9

[3]

- (a) Explain the steps involved in artificial hybridization.

OR

- (b) What are the main objectives of plant breeding programmes?

Question 10

[3]

Differentiate between infectious diseases and non-infectious diseases. Give *two* examples of each.

Question 11

[3]

Define:

- (a) Mutualism
- (b) Commensalism
- (c) Amensalism.

Question 12

[3]

Define species-area relationship. What is the significance of the slope of regression? Show with the help of a graph.

Question 13

[3]

Give six features of genetic code.

Question 14

[3]

State the measures to be taken by the owner of a dairy farm to improve the quality of milk and the quantity of its production.

Question 15

[3]

- (a) Draw a labelled diagram of the T.S of anther.

OR

- (b) Draw a labelled diagram of the L.S of anatropous ovule.

SECTION C (15 Marks)

(Answer **all** questions)

Question 16

[5]

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

OR

- (b) Answer the following:
- (i) What are *molecular scissors*? What is their role in rDT?
 - (ii) Explain the steps involved in *downstream processing*, in biotechnology.

Question 17

[5]

- (a) Expand the following terms and explain them briefly:

- (i) GIFT
- (ii) ZIFT
- (iii) RCH
- (iv) ICSI
- (v) IVF

OR

- (b) Classify the methods of contraception. Write short notes on *any two* of the methods mentioned by you.

Question 18

[5]

- (a) Answer the following questions:

- (i) If 10000 K cal energy is available at the level of producers, calculate the amount of energy at the level of secondary consumer.
- (ii) A snapdragon plant with red flowers was crossed with a plant with white flowers. It produced pink progeny in the F₁ generation. Explain the principle of inheritance involved with the help of Punnett square.

OR

- (b) Describe the process of DNA replication in prokaryotes.