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 **TWO PARTS**- Part I and Part II.*
*Answer **all** questions.*
Part I contains one question of 20 marks having four subparts.
Part II consists of Section A,B and 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

Questions 1

(a) Answer the following questions briefly and to the point: **[8x1]**

i. Give a point of difference between standing crop and standing state.

ii. What is Tricoderma? Give its use in modern agriculture.

iii. What is capacitation?

iv. Give two importance of biosphere reserves.

v. Give one example each of fungus which reproduce by
a) Budding
b) Conidia

vi. Are the wing of a bird and forelimb of a horse homologous or analogous? Name the type of evolution that explains the development of such structures.

vii. Give the biological name of the organism causing malaria.

viii. State Gause's competitive exclusion principle.

(b) Each of the following questions has four choices. Choose the best option in each case: **[4x1]**

(i) Human insulin consists of

(1) Chain A with 20 and chain B with 31 aminoacids.
(2) Chain A with 21 and chain B with 30 aminoacids.
(3) Chain A with 31 and chain B with 20 aminoacids.
(4) Chain A with 30 and chain B with 20 aminoacids.

(ii) The non-sense or terminator codons are

(1) UAA, UAG and UGA
(2) GUU, UAG and GCC

(3) UUU, AUG and UAA

(4) GCC, UAG and UGA

(iii) For producing protoplasts from plant cells, the following are required

(1) Amylase and pectinase

(2) Cellulose and amylase

(3) Cellulase and pectinase

(4) Cellulose and chitinase

(iv) Age of reptile is

(1) Mesozoic era

(2) Coenozoic era

(3) Palaeozoic era

(4) Archaeozoic era

(c) (i) Name the scientists concern with the following: [4x1/2]

(1) DNA/protein sequencing

(2) Method to transfer plasmid DNA in host cells

(3) Cistron, recon, muton

(4) Recreated probable conditions on primitive earth

(ii) Expand the following [4x1/2]

(1) IMR

(2) UTR

(3) PKU

(4) NPP

(d) Define the following [2x1]

(1) Polyembryony

(2) Codon

(e) Give a reason for each of the following [2x1]

(1) Bottled fruit juices are clearer as compared to those made at home.

(2) HIV is a retrovirus.

PART II

SECTION A (14 Marks)

Answer **all** questions

Question 2

(a) Mention four features of pBR 322. [2]

OR

(b) Explain the principle of inheritance involved in snapdragon flower with the help of Punnett square.

Question 3 [2]

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

Question 4 [2]

Explain rivet popper hypothesis.

Question 5 [2]

Write the source and the effect on the human body of the following drugs:

(a) Morphine

(b) Cocaine

Question 6 [2]

The percentage of nucleotide A in DNA isolated from human liver is observed to be 29.6%. What is the expected percentage of T, G and C? Jusity.

Question 7 [2]

(a) Explain MOET

OR

(b) Differentiate between inbreeding and outbreeding.

Question 8 [2]

What are the suggested reasons for population explosion?

SECTION B (21 Marks)

Answer ***all*** questions

Question 9 [3]

(a) Draw a labelled diagram of T.S of an anther.

OR

(b) Describe the development of a dicot embryo.

Question 10 [3]

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

Question 11 [3]

(a) Explain the steps involved in downstream processing in biotechnology.

Question 12 [3]

What is succession? State and explain the different types of succession.

Question 13 [3]

(a) Draw a labelled diagram of tRNA

OR

(b) Draw a labelled diagram of antibody

Question 14
Explain the hormonal control of spermatogenesis. [3]

Question 15
(a) With the help of suitable diagram describe the logistic population growth curve. [3]
(b) Define
(i) Carrying capacity
(ii) Stenothermal animals

SECTION C (15 Marks)

Answer ***all*** questions

Question 16
(a) [5]
(i) How has biotechnology been useful in controlling nematode infection in plants? Explain the technique involved in the process.
(ii) Name a sedimentary cycle and its reservoir.

OR

(b)
(i) Explain primary and secondary sewage treatment.
(ii) Give one source and one significance of single cell protein.

Question 17
(a) Explain the process of translation. [5]

OR

(b) Describe the process of DNA replication. Explain the role of the enzymes involved in DNA replication.

Question 18
(a) [5]
(i) What is an ecological pyramid? Draw pyramids of energy, biomass and number of an aquatic ecosystem.
(ii) Construct an ideal pyramid of energy when 1000000J of sunlight is available. Label all its levels.

OR

(b)
(i) Explain Oparin-Haldane theory
(ii) What do you mean by Hardy-Weinberg equilibrium? List any 2 factors that can disturb the genetic equilibrium.