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 Sections 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.

Question 1

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

(i) Give a significant point of difference between Oestrous and Menstrual cycle.

(ii) Give the biological name of the organism causing typhoid.

(iii) If the haploid number of chromosomes in a plant species is 20, how many chromosomes will be present in the cells of the shoot tip?

(iv) Name a plant which flowers every twelve years.

(v) Name the diagnostic test for AIDS.

(vi) Name the terminal stage of ageing in the life cycle of plants.

(vii) Which organisms constitute the last trophic level?

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

(i) Length of the DNA with 23 base pairs is:
   (1) 78.4 Å
   (2) 78.2 Å
   (3) 78 Å
   (4) 74.8 Å

(ii) Opium is obtained from:
    (1) *Papaver somniferum*
    (2) *Cannabis sativa*
    (3) *Erythroxylum coca*
    (4) *Datura metel*

(iii) According to Abiogenesis, life originated from:
     (1) Non-living matter
     (2) Pre-existing life
     (3) Oxygen
     (4) Extra-terrestrial matter

(iv) The largest unit in which gene flow is possible is:
     (1) Organism
     (2) Population
     (3) Species
     (4) Genes

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

(i) P. Maheshwari
(ii) E. Wilson
(iii) M. S. Swaminathan
(iv) H. Boyer

(d) Define the following: [2×1]

(i) Biopatent
(ii) Parthenocarpy

(e) Give a reason for each of the following: [2×1]

(i) Pollen grains of wind pollinated flowers are produced in large quantities.
(ii) Equilibrium of a forest ecosystem can be disturbed by uncontrolled hunting of big predators.
PART II
SECTION A (14 Marks)

(Answer all questions)

Question 2

(a) A woman with blood group O married a man with blood group AB. Show the possible blood groups of the progeny. List the alleles involved in this inheritance.

OR

(b) If the mother is a carrier of colour blindness and the father is normal, show the possible genotype and phenotype of the offspring of the next generation, with the help of a punnet square.

Question 3

Define life span. Give the life span of an elephant.

Question 4

Give two characteristic features of each of the following:

(a) Ramapithecus
(b) Cro-Magnon man

Question 5

(a) List any four effects of global warming.

OR

(b) State any four measures to control noise pollution.

Question 6

Define BOD. What is its significance in an aquatic ecosystem?

Question 7

Give one significant difference between each of the following pairs:

(a) Humoral immunity and cell mediated immunity.
(b) Benign tumour and malignant tumour

Question 8

Give four causes of infertility in males.
SECTION B (21 Marks)

(Answer all questions)

Question 9 [3]
(a) Draw a labelled diagram of L.S. of human testis.

OR
(b) Draw a labelled diagram of the mature embryo sac of angiosperms.

Question 10 [3]
Explain gene therapy, with reference to treatment of SCID.

Question 11 [3]
Study the table given below. Do not copy the table, but write the answers in the correct order.

<table>
<thead>
<tr>
<th>Scientific Name</th>
<th>Commercial Product</th>
<th>Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) ____________</td>
<td>Streptokinase</td>
<td>(b) ____________</td>
</tr>
<tr>
<td>Monascus purpureus</td>
<td>(c) ____________</td>
<td>(d) ____________</td>
</tr>
<tr>
<td>(e) ____________</td>
<td>Lactic acid</td>
<td>(f) ____________</td>
</tr>
</tbody>
</table>

Question 12 [3]
Explain industrial melanism.

Question 13 [3]
Describe the tissue culture technique in plants.

Question 14 [3]
Define the following:
(a) Spermiogenesis
(b) Reproductive health
(c) Amenorrhea

Question 15 [3]
(a) Define the following:
   (i) Hotspots
   (ii) Ramsar Sites
   (iii) Red data book

OR
(b) Define the following:
   (i) Biodiversity
   (ii) Eutrophication
   (iii) PAR

SECTION C (15 Marks)

(Answer all questions)

Question 16 [5]
(a) Describe post transcriptional processing of RNA in eukaryotes.

OR

(b) Describe Avery, McLeod and McCarty’s experiment. State its significance.

Question 17 [5]
(a) Write a short note on Chipko Movement.

OR

(b) Write a short note on Joint forest management.

Question 18 [5]
(a) What does PCR stand for? Describe the different steps of PCR.

OR

(b) Give an account of the Blue-White Method of selection of recombinants.