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) [8×1]

(i) Name the basic unit of classification.
(ii) Name the longest phase of mitosis.
(iii) What is the RQ value of carbohydrates?
(iv) Name a phylum showing radial symmetry.
(v) Define tidal volume.
(vi) Give an example of an insectivorous plant.
(vii) What is the function of ribosomes?
(viii) Why is Blood group ‘O’ called universal donor?
Each of the following questions has four choices. Choose the correct option in each case:

(i) Adenosine is a:
   (1) Nucleoside
   (2) Nucleotide
   (3) Protein
   (4) Derived lipid

(ii) The pressure applied by the cell contents on the cell wall is:
   (1) Wall pressure
   (2) Root pressure
   (3) Turgor pressure
   (4) Osmotic pressure

(iii) Which of the following hormones regulate basal metabolic rate?
   (1) Growth hormone
   (2) Insulin
   (3) Glucocorticoids
   (4) Thyroxine

(iv) When calyx and corolla cannot be differentiated from each other, they are collectively known as:
   (1) Syncarpous
   (2) Perianth
   (3) Gamopetalous
   (4) None of these

(c) Give one significant contribution of each of the following scientists:

(i) W. M. Stanley
(ii) Engelmann in the field of photosynthesis
(d) Define the following: [3×1]
(i) Oogamy
(ii) Perispem
(iii) Emphysema

e) Answer the following: [3×1]
(i) Under what clinical conditions does a patient need haemodialysis?
(ii) What is the role of *Azospirillum* in nitrogen cycle?
(iii) Give one difference between *metacentric chromosomes* and *sub-metacentric chromosomes*.

PART II

SECTION A (14 Marks)

(Answer all questions)

Question 2 [2]

(a) Draw a labelled diagram of TS of mammalian gut.

OR

(b) Draw a labelled diagram of LS of mammalian kidney.

Question 3 [2]

Differentiate between *monocots* and *dicots*, with reference to their root system and venation in the leaves.

Question 4 [2]

Define *cell theory*. Who proposed the cell theory?

Question 5 [2]

State *four* physiological functions of auxins.
Question 6
Write a short note on *double circulation*.

Question 7
Define:
(a) Hydroponics
(b) Guttation

Question 8
(a) Give *four* differences between *prokaryotic cells* and *eukaryotic cells*.

**OR**

(b) Give *four* differences between *mitosis* and *meiosis*.

SECTION B (21 Marks)
*(Answer all questions)*

Question 9
Name the three systems of classification of living organisms. Give one salient feature of each of the three systems.

Question 10
(a) Describe different types of gynoecia on the basis of position of ovary with respect to other floral whorls.

**OR**

(b) Describe different types of neurons on the basis of their polarity.

Question 11
Define the following:
(a) Plasmodesmata
(b) Plasmolysis
(c) Gustatoreceptor
Question 12 [3]
Draw a well labelled diagram of electron microscopic structure of TS of cilia.

Question 13 [3]
(a) Describe any three factors affecting the process of imbibitions.

OR

(b) Describe any three external factors affecting the process of photosynthesis.

Question 14 [3]
Give the function of the following in a cockroach:

(a) Hepatic caeca
(b) Spiracles
(c) Mushroom gland

Question 15 [3]
Give the cause and one symptom of the following diseases:

(i) Angina pectoris
(ii) Gout
(iii) Constipation

SECTION C (15 Marks)
(Answer all questions)

Question 16 [5]
(a) Draw a well labelled diagram of electron microscopic structure of the chloroplast.

OR

(b) Draw a well labelled diagram of electron microscopic structure of a eukaryotic cell.
Question 17

(a) Describe an experiment to show the downwards transport of organic solutes through phloem.

OR

(b) (i) What are the criteria of essentiality of minerals in plants?

(ii) Give the characteristic role of nitrogen and phosphorus in plant.

Question 18

(a) Explain the chemical events occurring during muscle contraction.

OR

(b) Describe the physiology of urine formation.