

# 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)

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*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.***

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### 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?

- (b) Each of the following questions has four choices. Choose the correct option in each case: [4×1]
- (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: [2×1]
- (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** [2]

Write a short note on *double circulation*.

**Question 7** [2]

Define:

- (a) Hydroponics
- (b) Guttation

**Question 8** [2]

- (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** [3]

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

**Question 10** [3]

- (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** [3×1]

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**

**[5]**

- (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**

**[5]**

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

**OR**

- (b) Describe the physiology of urine formation.