

# BIOLOGY

## PAPER – I

### (THEORY)

(Three hours)

(Candidates are allowed additional fifteen minutes for only reading the paper.

They must NOT start writing during this time.)

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**All questions are compulsory**

The question paper consists of two parts, Part I and Part II.

**Part I consists of four sections A, B, C and D.**

Section A has 9 questions of one mark each, Section B has 6 questions of two marks each, Section C has eight questions of three marks each, Section D has three questions of 5 marks each.

There is no overall choice, however an internal choice has been provided in two questions of Section B and two questions in Section C and all questions of Section D.

**Part II is the Text Based Assessment which carries 10 Marks.**

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## PART I (60 Marks)

### SECTION A

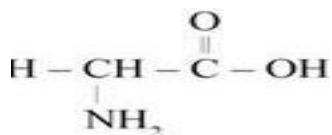
#### Question 1

Answer the following questions briefly and to the point:

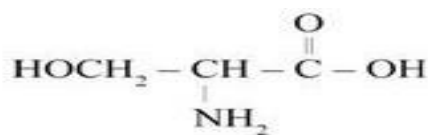
[9×1]

- (i) The basic unit of classification is:
  - (a) Family
  - (b) Order
  - (c) Species
  - (d) Genus
  
- (ii) The white fibres are chemically composed of:
  - (a) Myosin
  - (b) Elastin
  - (c) Collagen
  - (d) Actin
  
- (iii) Pick the odd one out:
  - (a) Chlamydomonas
  - (b) Spirogyra
  - (c) Chara
  - (d) Funaria.

- (iv) Velamen absorbs moisture from:
- Water
  - Air
  - Mineral salts
  - Root
- (v) Name the bond formed when the amino group of an amino acid is linked to the carboxyl group of another amino acid.
- (vi) Identify **A** and **B**



**A**



**B**

- (vii) Write *any two* characteristic features of bone as a connective tissue.
- (viii) “Diastase is heated above 48-50 degrees Celsius” State *one* change in the enzyme that one would observe.
- (ix) What are the different phases of the *Interphase* stage of mitosis?

### **SECTION B**

#### **Question 2**

[2]

Give *two* differences between *Photoperiodism* and *Vernalization*.

**OR**

Give *two* differences between *short day* plants and *long day* plants.

[2]

#### **Question 3**

You are given a permanent slide. Upon observing it under the microscope it appears as a double membranous cell organelle with a highly folded inner membrane showing knob like elementary particles. Name the cell organelle and mention *two* functions of it.

[2]

#### **Question 4**

With the help of a labelled diagram describe characteristics of flowers showing racemose inflorescence.

#### **Question 5**

[2]

Draw a labelled diagram of a maize seed.

**OR**

Draw a labelled diagram of a bean seed.

#### **Question 6**

[2]

A sketch of a monocot and dicot root was provided to you showing epiblema, cortex and endodermis. Name *two* common and *two* different features that you would draw in the sketches.

#### **Question 7**

[2]

Explain the term *alternation of generation* with the help of an example.

## SECTION C

**Question 8** [3]  
“In certain flowers stamens are united by their filaments or only by the anthers or both”.

Give the technical term for their union and name and explain the type of union seen in Hibiscus and Pea.

**Question 9** [3]  
State *three* distinguishing characteristics of *Ctenophora*.

**OR**

State *three* distinguishing characteristics of *Chondrichthyes*.

**Question 10** [3]  
A student while examining the leaves of a plant growing in his garden and observed a few symptoms. Help the student identify the deficiency disease based on the symptoms given below:

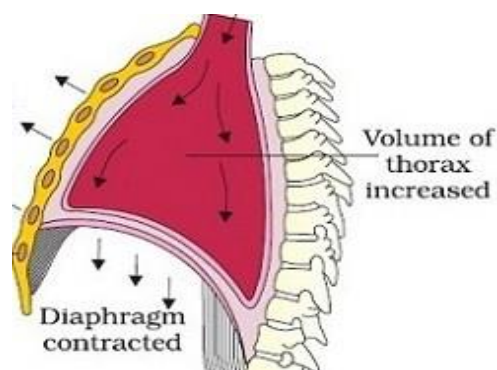
- (i) Leaves on the plant were completely yellow.
- (ii) Tips of the leaves were shrivelled and dying.
- (iii) There were green and non-green patches on certain leaves.

**Question 11** [3]  
“Succinate dehydrogenase shows competitive inhibition”. Explain.

**OR**

Give an outline classification of enzymes according to the type of reactions catalysed by them.

**Question 12** [3]  
Name and explain the process shown in the diagram below:



**Question 13** [3]  
Explain the mechanism of heartbeat in humans.

**Question 14** [3]  
(a) Why is glomerular filtrate hypertonic and hypotonic in the descending and ascending loop of Henle?  
(b) What is the effect of ADH on the collecting ducts?

**Question 15** [3]  
Draw a labelled diagram of a semiautonomous organelle in a cell.

## SECTION D

**Question 16**

[5]

- (a) Give a graphic representation of the photosynthetic cycle seen in Maize and Sugarcane.  
(b) Elaborate:  
(i) ABA  
(ii) RUBISCO

**OR**

Explain in detail the Calvin cycle. Draw a labelled sketch of the same.

**Question 17**

[5]

Explain with the help of diagrams the various stages of Prophase I of Meiosis.

**OR**

Describe in detail with a diagram the structure of DNA with functions.

**Question 18**

[5]

Describe the formation of a root nodule in legume plants. Draw sketches in support of your answer.

**OR**

Describe the nitrogen cycle. Draw a labelled sketch in support of your answer.

### **Part II: Text Based Assessment (10 Marks)**

*Read the given text carefully and answer the questions that follow.*