

**BIOLOGY**  
**PAPER - 1**  
**(THEORY)**  
**(Botany and Zoology)**

*(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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*Answer **all** questions in Part I and **five** questions in Part II, choosing **three** questions from Section A and **two** questions from Section B.*

*All working including rough work, should be done on the same sheet as, and adjacent to, the rest of the answer.*

*The intended marks for questions or parts of questions are given in brackets [ ].*

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**PART I (20 Marks)**

*Answer **all** questions.*

**Question 1**

- (a) Give *one* significant difference between each of the following: [5]
- (i) *Plasmolysis* and *Deplasmolysis*.
  - (ii) *Tendon* and *Ligament*.
  - (iii) *Threatened* and *endangered* species.
  - (iv) *Vasectomy* and *Tubectomy*.
  - (v) *Absorption spectrum* and *Action spectrum*.
- (b) Explain what would happen if: [5]
- (i) A green plant is exposed to green light only.
  - (ii) The cerebellum is injured.
  - (iii) Short day plants are exposed to red light followed by exposure to far-red light.
  - (iv) There is over-secretion of growth hormone after adolescence.
  - (v) A flower bud is emasculated and auxin is applied on the stigma.

- (c) Each of the following questions / statements have four suggested answers. [3]  
Rewrite the correct answer in each case:
- (i) Which one of the following does not depend on a large surface area for its efficient functioning?
- (A) A root hair
  - (B) An alveolus of the lungs
  - (C) A villus of the small intestine
  - (D) A ventricle of the human heart.
- (ii) In a non-woody herbaceous plant, support is provided by:
- (A) Turgor pressure on cell walls
  - (B) Atmospheric pressure on cells
  - (C) Suction pressure of the cells
  - (D) Root pressure.
- (iii) The storage of sugar as glycogen in the liver is increased in the presence of:
- (A) Thyroxin
  - (B) Rennin
  - (C) Insulin
  - (D) Adrenalin
- (iv) The specific function of light energy in the process of photosynthesis is to:
- (A) Reduce carbon dioxide
  - (B) Synthesise glucose
  - (C) Activate chlorophyll
  - (D) Split water
- (v) Which one of the following helps the eye to adjust the focal length of the lens?
- (A) Cornea
  - (B) Aquous humour
  - (C) Ciliary body
  - (D) Conjunctiva
- (vi) Introduction of dead or weak microbes into the body is known as:
- (A) Immunisation
  - (B) Vaccine
  - (C) Sterilization
  - (D) Vaccination

- (d) Mention the most significant function of the following: [3]
- (i) Ear ossicles
  - (ii) Hyaluronidase
  - (iii) Thylakoid membranes
  - (iv) Pericycle
  - (v) Piameter
  - (vi) Lymphocytes
- (e) State the best known contribution of: [2]
- (i) Chardack
  - (ii) Darwin
  - (iii) T.R. Malthus
  - (iv) William Roentgen
- (f) Expand the following : [2]
- (i) PEM
  - (ii) BCG
  - (iii) AIDS
  - (iv) TSH

## **PART II (50 Marks)**

### **SECTION A**

*Answer any **three** questions.*

#### **Question 2**

- (a) Draw a neat and fully labelled diagram of the V.S of a dicot leaf. [4]
- (b) Discuss the role of  $K^{-1}$  ions in the opening and closing of stomata. [3]
- (c) What are *aggregate fruits*? Give *two* examples. [3]

#### **Question 3**

- (a) How do nastic movements differ from tropic movements? Describe *any three* types of nastic movements in plants. [4]
- (b) Give an account of the Tunica Corpus Theory. [3]
- (c) Enlist the general functions of mineral elements in the life of a plant. What is meant by essentiality of an element? [3]

**Question 4**

- (a) Describe the process of digestion and absorption of fats. [4]
- (b) How is oxygen transported in the blood and released in the tissues? [3]
- (c) Draw a labelled diagram of the cochlea of the ear. [3]

**Question 5**

- (a) Describe the flow of blood through the heart during different phases of the cardiac cycle. [4]
- (b) Explain one cause and symptom of each of the following: [3]
  - (i) Constipation
  - (ii) Uremia
  - (iii) Gout.
- (c) State the differences between *bone* and *cartilage*. [3]

**Question 6**

- (a) Explain the *counter current* system in a nephron. [4]
- (b) Describe the structure and functions of the xylem. [3]
- (c) Write *three* differences between cyclic and noncyclic photophosphorylation. [3]

**SECTION B**

*Answer any two questions.*

**Question 7**

- (a) Give an account of Lederberg's replica-plating experiment to show the genetic basis of adaptation. [4]
- (b) Explain *three* objections against Lamarck's theory of inheritance. [3]
- (c) Define: [3]
  - (i) Biotic potential
  - (ii) Gene pool
  - (iii) Heterosis.

**Question 8**

- (a) Write the causative agent and the most important symptom of each of the following diseases: [4]
- (i) Dengue
  - (ii) Tuberculosis
  - (iii) Ascariasis
  - (iv) Chicken pox.
- (b) Explain the role of bacteria in improving soil fertility. [3]
- (c) What is Biomedical Engineering? Give *two* examples. [3]

**Question 9**

- (a) Briefly mention the measures you would suggest to control population explosion in India. [4]
- (b) Explain the origin of wheat in the form of a flow chart. [3]
- (c) What is amniocentesis? Explain its role in modern medical treatment. [3]

**Question 10**

- (a) Write *two* similarities and *two* differences between the *Cro-Magnon* man and the *Homo sapiens*. [4]
- (b) Explain *each* briefly: [3]
- (i) Captive breeding
  - (ii) National Park
  - (iii) In-situ conservation.
- (c) What is plant introduction? Give *two* examples. [3]