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.)

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 [ ].

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. Rewrite the correct answer in each case: **[3]**

(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 Lamark'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) Tubercolosis

(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]**