

**BIOLOGY PAPER 1 (THEORY)**

**PART I (20 Marks)**

*Answer all questions.*

**Question 1**

- (a) Mention *one* significant difference between each of the following: [5]
- (i) *Parenchyma and Sclerenchyma.*
  - (ii) *Epistasis and dominance.*
  - (iii) *Hormones of ovulatory phase and hormones of luteal phase.*
  - (iv) *Symplastic movement and apoplastic movement.*
  - (v) *Phenotype and Genotype.*
- (b) Give reasons for the following: [5]
- (i) Testes descend into the scrotum before birth.
  - (ii) Secondary growth does not occur in monocot stems.
  - (iii) Nitrogenous fertilizers are not applied in fields where leguminous crops grow.
  - (iv) Genetic code is 'universal'.
  - (v) At higher temperatures, green plants start evolving CO<sub>2</sub> instead of O<sub>2</sub>.
- (c) Each of the following questions / statements has four suggested answers. Rewrite the correct answer in each case: [5]
- (i) Typhoid is classified as a:
    - (A) Viral disease
    - (B) Genetic disorder
    - (C) Bacterial disease
    - (D) Protozoan disease
  - (ii) Bt cotton is resistant to:
    - (A) Insects
    - (B) Herbicides
    - (C) Salt
    - (D) Drought
  - (iii) Roots and shoots lengthen through the activity of:
    - (A) Apical meristem
    - (B) Vascular Cambium
    - (C) Lateral meristem
    - (D) Cork Cambium
  - (iv) An antiviral protein released from infected and dying cells is:
    - (A) Antigen
    - (B) Antibody
    - (C) Antiserum
    - (D) Interferon
  - (v) Opening and closing of stomata is due to:
    - (A) Ca<sup>2+</sup>
    - (B) Na<sup>+</sup>
    - (C) K<sup>+</sup>
    - (D) Cl<sup>-</sup>
- (d) State the best known contribution of: [3]
- (i) Alec Jeffery
  - (ii) P.K. Sethi
  - (iii) Hugo de Vries
- (e) Expand the following : [2]
- (i) SCID
  - (ii) ZIFT

**PART II (50 Marks)**

**SECTION A**

*Answer any two questions.*

**Question 2**

- (a) Describe the Miller and Urey experiment on the origin of life. [3]  
(b) Define the following: [2]  
(i) Frame shift mutations.  
(ii) Genetic drift.

**Question 3**

- (a) Name and define the *three* types of natural selection. [3]  
(b) State the following: [2]  
(i) Hardy Weinberg's principle  
(ii) Theory of recapitulation

**Question 4**

- (a) Mention the important features of the Neanderthal man. [3]  
(b) What are homologous organs? How do they help in providing evidence for organic evolution? [2]

**SECTION B**

*Answer any two questions.*

**Question 5**

- (a) Describe the different types of vascular bundles. [4]  
(b) Give *three* anatomical differences between a *monocot root* and a *dicot root*. [3]  
(c) Explain the effect of light and temperature on photosynthesis. [3]

**Question 6**

- (a) Explain the transpiration pull theory for ascent of sap. [4]  
(b) Explain the process of spermatogenesis in humans. [3]  
(c) Define the following: [3]  
(i) Placentation  
(ii) Parthenocarpy  
(iii) Diffusion

**Question 7**

- (a) Why are xylem and phloem classified as complex tissues? Describe the structure of phloem. [4]  
(b) Describe the ultra-structure of chloroplast. [3]  
(c) State *three* functions of the placenta. [3]

### SECTION C

Answer any two questions.

#### Question 8

- (a) Describe the experiment performed by Griffith. What conclusions did he infer from his observations? [4]
- (b) What is artificial insemination? Mention two ways in which it is useful in breeding of dairy animals. [3]
- (c) What is *single cell protein*? Give its source and significance. [3]

#### Question 9

- (a) How did Hershey and Chase prove that DNA is the genetic material? [4]
- (b) Give one main application of each of the following: [3]
  - (i) MRI
  - (ii) Ultrasound
  - (iii) ECG
- (c) Explain the role of stem cells in medical treatment. [3]

#### Question 10

- (a) Write short notes on: [4]
  - (i) Multiple Alleles
  - (ii) Artificial measures to control population
- (b) What complications will arise if the blood of an Rh positive person is transfused to an Rh negative person and vice versa? [3]
- (c) State any three goals of the human genome project. [3]