

INTRODUCTION TO BIOLOGY (BTC3223)

Time Allotted : 2½ hrs

Full Marks : 60

Figures out of the right margin indicate full marks.

*Candidates are required to answer Group A and
any 4 (four) from Group B to E, taking one from each group.*

Candidates are required to give answer in their own words as far as practicable.

Group – A

1. Answer any twelve:

12 × 1 = 12

Choose the correct alternative for the following

- (i) Which of the following cell organelles is absent in animal cells and present in plant cells
 - (a) Mitochondria
 - (b) Plastid
 - (c) Cell membrane
 - (d) Vacuole
- (ii) Which of the following bases is absent in RNA
 - (a) Thymine
 - (b) Adenine
 - (c) Guanine
 - (d) Cytosine
- (iii) Enzymes are generally
 - (a) Carbohydrate
 - (b) Lipid
 - (c) Protein
 - (d) Nucleic acid
- (iv) Glucose polymerises to form
 - (a) Starch
 - (b) Glycogen
 - (c) Cellulose
 - (d) All of these
- (v) One example of polysaccharide is
 - (a) Glucose
 - (b) Sucrose
 - (c) Lactose
 - (d) Starch
- (vi) The coenzyme is
 - (a) Often a metal
 - (b) Always a metal
 - (c) Often a Vitamin
 - (d) Always an organic compound
- (vii) Enzymes present in intestinal juice is
 - (a) Pepsin
 - (b) Renin
 - (c) Trypsin
 - (d) Sucrase
- (viii) The greatest biodiversity on earth can be found in
 - (a) African grasslands
 - (b) Amazonian rain forest
 - (c) Western Ghats
 - (d) Nile Delta

- (ix) Place where the threatened animals and plants are protected for special care is known as
 (a) In situ Conservation (b) Ex-situ Conversation
 (c) Wildlife Sanctuary (d) National Park
- (x) Global warming can be controlled by
 (a) Increasing solid waste (b) Reducing water wastage
 (c) Burning human-generated waste (d) Reducing fossil fuel consumption

Fill in the blanks with the correct word

- (xi) Lactose is found in _____.
 (xii) The cell organelle where ATP is produced is _____.
 (xiii) Phospholipid is present in _____.
 (xiv) _____ is an enzyme responsible for breaking of bonds.
 (xv) _____ is an example of ex-situ conservation.

Group - B

2. (a) What are the postulates of modern cell theory? [[C01](Remember/LOCQ)]
 (b) Discuss the structure of Nucleus of a cell. [[C01](Understand/IOCQ)]
 (c) Differentiate between cell wall and cell membrane. [[C02](Analyse/HOCQ)]
4 + 4 + 4 = 12
3. (a) Distinguish between DNA and RNA in terms of its structure and function. [[C04](Remember/LOCQ)]
 (b) What is the central dogma of molecular biology? How the modern central dogma differs from it? [[C04](Analyse/HOCQ)]
 (c) Analyze the salient features of genetic code. [[C04](Analyze/IOCQ)]
4 + 4 + 4 = 12

Group - C

4. (a) Give one example of the following:
 (i) Monosaccharide
 (ii) Polysaccharide
 (iii) Saturated fatty acid
 (iv) Unsaturated fatty acid
 (v) Essential fatty acid. [[C03](Memorize/LOCQ)]
 (b) What are triglyceride and cholesterol? Mention their physiological function. [[C03] (Remember/IOCQ)]
 (c) What are simple and conjugate proteins? [[C02](Apply/HOCQ)]
5 + 4 + 3 = 12
5. (a) Classify the lipids in terms of structure and function. [[C03](Apply/IOCQ)]
 (b) What are stem cells? Describe the three unique properties of stem cells. [[C02](Remember/LOCQ)]

- (c) Distinguish between anabolism and catabolism with suitable example. [[C02](Understand/HOCQ)]
4 + 4 + 4 = 12

Group - D

6. (a) State how different factors affect enzyme activity. [[C05] (Analyse/IOCQ)]
 (b) Comment on the commercial applications of enzymes in diagnostics and healthcare. [[C05] (Remember/LOCQ)]
 (c) Discuss the 'Induced fit model' of enzyme action. [[C05] (Analyse/IOCQ)]
4 + 4 + 4 = 12
7. (a) Analyse the concept of restriction modification system. [[C05] (Analyse/IOCQ)]
 (b) Show with a diagram the formation of Blunt ends and Sticky ends. [[C05] (Illustrate/IOCQ)]
 (c) Give a brief outline of the commercial importance of restriction enzymes. [[C05] (Understand/LOCQ)]
4 + 4 + 4 = 12

Group - E

8. (a) Compare between bioattenuation, biostimulation and bioaugmentation. [[C06](Compare/IOCQ)]
 (b) Discuss the concept of Biopiracy with an example. [[C06](Understand/LOCQ)]
 (c) Explain the benefits of biodiversity preservation. [[C06](Analyze/IOCQ)]
4 + 4 + 4 = 12
9. (a) Distinguish between ex-situ and in-situ conservation methods. [[C06](Differentiate/IOCQ)]
 (b) Comment on the advantages and disadvantages of Bioremediation. [[C06] (Remember/LOCQ)]
 (c) Discuss about recent advances in engineering designs inspired by examples in biology. [[C06](Apply/HOCQ)]
4 + 4 + 4 = 12

Cognition Level	LOCQ	IOCQ	HOCQ
Percentage distribution	34.37	45.84	19.79

