

2014

Time : 3 hours

Full Marks : 80

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

The figures in the margin indicate full marks.

Answer any five questions in which

Q. No. 1 is compulsory.

1. Select the correct answer out of the various options given below : $1 \times 16 = 16$

(a) Which one of the following are informational biomolecules ?

(i) Proteins and nucleic acids

(ii) Carbohydrates

(iii) Lipids

(iv) All of the above

(b) Which one of the following amino acids has the largest number of rotatable bonds in the side chain ?

(i) Tryptophan

(ii) Leucine

(iii) Lysine

(iv) Cysteine

(c) Heterotropic enzymes :

(i) Are different isoenzymes

(ii) Are modified by their substrate concentration

(iii) Are stimulated or inhibited by an effector or modulator molecule other than their substrate

(iv) Have same V_{max} but different K_m values

(d) Enzyme activity is regulated by :

(i) Feed back regulation

(ii) Allosteric enzymes

(iii) Reversible covalent modification

(iv) All of the above

(e) Enzymes with different molecular configurations, but with same functions are called :

- (i) Apoenzymes
- (ii) Isoenzymes
- (iii) Coenzymes
- (iv) Inducible enzymes

(f) A coenzyme is :

- (i) A carbohydrate that controls enzymatic activity
- (ii) A nucleic acid
- (iii) Avitamin that acts with an enzyme
- (iv) An inorganic compound

(g) The common phase in aerobic and anaerobic respiration is :

- (i) Tricarboxylic acid cycle
- (ii) Oxidative phosphorylation
- (iii) Glycolysis
- (iv) None of the above

(h) In C_4 plants, phosphoenol pyruvate carboxylase is located in :

- (i) Cytosol
- (ii) Chloroplast
- (iii) Peroxisome
- (iv) Mitochondrion

(i) In photorespiration, glycolate and glyoxylate are produced sequentially in the following organelles :

- (i) Chloroplast and mitochondria
- (ii) Chloroplast and peroxisome
- (iii) Mitochondria and peroxisome
- (iv) Peroxisome and chloroplast

(j) Asymmetrical distribution of radio-carbon in glucose and glucose 6-phosphate is called :

- (i) Pasteur effect
- (ii) Gibbs effect
- (iii) Lang effect
- (iv) Crab-tree effect

(k) Three dimensional structure of protein can be determined to the atomic level by :

- (i) The technique of X-ray crystallography
- (ii) The nuclear magnetic resonance spectroscopy

- (iii) Both (i) and (ii)
- (iv) None of these

(l) In eukaryotes DNA replication takes place in :

- (i) G₀ Phase
- (ii) G₁ Phase
- (iii) S phase
- (iv) M phase

(m) Smallest unit of DNA capable of coding for the synthesis of polypeptide is the :

- (i) Operon
- (ii) Cistron
- (iii) Replicon
- (iv) Repressor gene

(n) Enzyme required for transcription is :

- (i) DNA Polymerase
- (ii) RNA Polymerase
- (iii) RNA ase
- (iv) Endonuclease

(o) The length of DNA which is wrapped over histone octomer consists of :

- (i) 140 bp
- (ii) 146 bp
- (iii) 160 bp
- (iv) 200 bp

(p) Antigen binds to antibody. The binding is a result of :

- (i) Covalent bonds
- (ii) Disulphide bonds
- (iii) Amide formation
- (iv) Electrostatic interactions

Discuss the nature, classification and properties of enzymes. \approx 4+8+4 = 16

3. Give an account of the uses of enzymes in industries, medicines and production of new compounds. 16

4. What is ^{C₃} photorespiration? How does it differ from dark respiration? Give the mechanism of photorespiration in C₃ plants. 4+4+8 = 16

5. What are proteins? Give an account of configuration of protein. Add a note on the denaturation of proteins. 4+8+4 = 16

6. Give an account of the replication of DNA in eukaryotes. 16

7. Describe the mechanism of the antigen-antibody reaction. 16

8. Describe the structure and classification of lipids. 16

9. Write short notes on any four of the following : 4×4 = 16

(a) Immobilization of enzymes

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(7)

(Turn over)

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(b) Nature of biological material

(c) Covalent and non-covalent bonds

(d) Nucleotides

(e) Photophosphorylation and oxidative phosphorylation

(f) Reducing and non-reducing sugars



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(8)

AA(H-1) — VBT (1)
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