

2018

ZOOLOGY

(Major)

Paper : 5.2

(**Biochemistry and Bioenergetics**)

Full Marks : 60

Time : 3 hours

*The figures in the margin indicate full marks
for the questions*

1. Answer the following as directed : 1×7=7

(a) What is protein denaturation?

(b) The sugars which differ from one another only in the configuration of one carbon atom are termed as ____ of each other.

(Fill in the blank)

(c) A low value of K_M indicates

(i) high substrate concentration

(ii) high product concentration

(iii) weak enzyme-substrate binding

(iv) strong enzyme-substrate binding

(Choose the correct answer)

(d) Starch is formed by ____ bond.
(Fill in the blank)

(e) Name two simple fibrous proteins.

(f) ____ are esters of fatty acids with higher alcohols.
(Fill in the blank)

(g) What are cofactors?

2. Write very brief answer of the following
(any four) : 2×4=8

(a) Differentiate between essential fatty acid and non-essential fatty acid with examples.

(b) How is protein associated with chromosomes?

(c) Explain Henderson-Hasselbalch equation.

(d) State the properties of enzymes.

(e) Explain entropy and enthalpy.

(f) Write the role of F_0-F_1 complex in ATP synthesis.

3. Answer the following briefly (any three) :

5×3=15

- (a) Explain the second law of thermodynamics.
- (b) Define buffers. State the important buffer systems of the body.
- (c) State the role of high energy phosphates as 'energy currency' of the cell.
- (d) Write the biological importance of lipid.
- (e) Describe the ornithine cycle.

4. Answer the following (any three) : 10×3=30

- (a) Describe β -oxidation of fatty acid. 10
- (b) What are the protein and lipid constituents of plasma membrane? Write the functions of plasma membrane with special emphasis on transport through plasma membrane. 2+2+6=10
- (c) Describe the mechanism of enzyme action. State the factors influencing the enzyme activity. 5+5=10
- (d) Describe oxidative phosphorylation. Explain the chemiosmotic hypothesis of oxidative phosphorylation. 3+7=10

(e) Describe the structure of protein. State how the structure of protein determines biological functions. 5+5=10

(f) What is meant by enzyme kinetics? Discuss Michaelis-Menten equation with suitable explanation. 2+8=10

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