

2 0 1 6

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 questions : 1×5=5
- (a) Write Henderson-Hasselbalch equation.
 - (b) Arrange the following in increasing order of acidic strength :
Lactic acid, Acetic acid, Pyruvic acid
 - (c) Write the names of two non-protein amino acids.
 - (d) Define isoelectric point.
 - (e) Pepsin is an example of which 'class' of enzyme?

(2)

2. Fill in the blanks : $1 \times 2 = 2$
- (a) The prosthetic group of cytochrome is ____.
- (b) The site of ETC, inhibited by cyanide is ____.
3. Write very brief answer of the following : $2 \times 4 = 8$
- (a) Discuss the lock-and-key hypothesis of enzyme activity.
- (b) State the significance of buffer in biological system.
- (c) What is an isoenzyme? Give an example of isoenzyme.
- (d) Explain the chemiosmotic hypothesis.
4. Answer briefly any *three* of the following : $5 \times 3 = 15$
- (a) Explain the ornithine cycle. 5
- (b) What is chromatin? Describe the structural organization of nucleosome. $1 + 4 = 5$
- (c) Discuss the biological significance of saturated and unsaturated fatty acids. 5

(3)

- (d) Write an account of various factors affecting enzyme activity. 5
- (e) What is Gibbs' free energy? Explain the free energy changes in a redox reaction with suitable example. $1 + 4 = 5$
5. Answer any *three* of the following : $10 \times 3 = 30$
- (a) What is enzyme kinetics? Explain the Michaelis-Menten model of enzyme kinetics. Discuss the different types of enzyme inhibition with example. $1 + 4 + 5 = 10$
- (b) "The biosynthesis of long-chain fatty acids in animal tissues is not a direct reversal of fatty acid oxidation." Justify the statement. 10
- (c) Describe the process of hydrogen transfer along the respiratory chain. 10
- (d) Describe the different orders of protein structure (conformation). Write an account of classification of protein. $5 + 5 = 10$
- (e) Describe how proteins come together in the plasma membrane and function in macromolecular assemblies. 10
- (f) Write in detail the process of formation of 70s and 80s ribosomes. $5 + 5 = 10$

★ ★ ★