2016

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. Fill in the blanks : 1×2=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 : 2×4=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 : 5×3=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

(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 : 10×3=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

★★★