# 2017

## ZOOLOGY

## ( Major )

### ( Biochemistry and Bioenergetics )

Paper : 5.2

*Full Marks* : 60

*Time* : 3 hours

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

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

*(a)* The hydrogen ion ($H^+$) with its high ratio of charge cannot exist free in aqueous solution.

( State True or False )

*(b)* *Cis-trans* isomerism occurs in compounds with _____ bonds.

( Fill in the blank )

*(c)* Keratin, the protein of hair, is synthesized from _____ amino acids.

( Fill in the blank )

(d) What do you mean by amino sugars?

(e) Fatty acids can be transported into and out of mitochondria through

(i) active transport

(ii) facilitated transfer

(iii) non-facilitated transfer

(iv) None of the above

( Choose the correct answer )

(f) The $Na^+ — K^+$ ATPase catalyzes the hydrolysis of _____ to _____.

( Fill in the blanks )

(g) The fatty acids containing even number and odd number of carbon atoms as well as the unsaturated fatty acids are oxidised by _____.

( Fill in the blank )

2. Write very brief answer of the following : 2×4=8

(a) What is the pH of Blood? How is it regulated?

(b) Differentiate between Heterochromatin and Euchromatin.

(c) Write two important aspects of Lysozyme.

(d) Write the significance of Free Energy.

3. Answer briefly any *three* of the following : 5×3=15

(a) Write a short note on Acid-Base balance.

(b) What is Optical Isomerism? Explain with example.

(c) Write a short note on Coenzymes.

(d) Write the biological significance of carbohydrate.

(e) Explain the conformational coupling hypothesis of oxidative phosphorylation.

4. Answer any *three* of the following :

(a) What are Proteins? What is the primary structure of proteins? Describe briefly the biological importance of protein. 1+3+6=10

(b) Describe the ultrastructure of Plasma-Membrane as proposed by Singer and Nicolson. State the functions of plasma membrane. 5+5=10

(c) How are Enzymes classified? Describe the mechanism of enzyme action. 4+6=10

(d) What do you mean by Thermodynamics? Discuss the 2nd law of Thermodynamics in relation to biological study. 2+8=10

(e) What is ATP? Write down the role of ATP in metabolism and in free energy production. 2+8=10

(f) What is a respiratory chain? Describe briefly the organization of the respiratory chain in a mitochondria. 10

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