B.Sc. 3rd Semester (Honours) Examination, 2018 (CBCS)

Subject : Zoology

Paper : CC-T7

(Biochemistry)

Time: 2 Hours **Full Marks: 40**

The figures in the margin indicate full marks.

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

Group-A

1. Answer *any five* questions: 2×5=10

(a) Name one structural isomer of glucose with structure.

(b) What is the metabolic fate of lactate in mammalian cells?

(c) What are sphingolipids? Give one example.

(d) What is amino sugar? Give an example.

(e) What forces hold protein subunits in a tertiary and quaternary structure?

(f) What is 'hyperchromic shift' of DNA?

(g) Name and draw the structure of pentose sugar found in RNA.

(h) What is isozyme? Cite example.

Group-B

2. Answer *any two* questions: 5×2=10

(a) What is the overall pathway in glycolysis? What are the possible metabolic fates of pyruvate? 3+2=5

(b) Discuss the reactions of urea-cycle. In which organ arginase is present? 4+1=5

(c) What is the complete base composition of a double stranded eukaryotic DNA that contains 22 percent guanine? Why is it necessary to specify that DNA in the above question is double stranded? 3+2=5

(d) How can competitive and non-competitive inhibition be distinguished in terms of k_m? Where do lines intersect on a Lineweaver – Burk plot showing competitive inhibition and showing non-competitive inhibition? 2+1½+1½=5

Group-C

3. Answer *any two* questions: 10×2=20

(a) What is β-oxidation of fatty acids? Write down the metabolic pathway of β-oxidation. What happens to the $FADH_2$ and NADH produced during each cycle of β-oxidation? How many molecules of acetyl CoA are generated by the β-oxidation of palmitic acid? 2+4+2+2=10

(b) What does SDS-PAGE stand for? What is the basis for the separation of proteins by SDS-PAGE? What is the approximate molecular weight of a protein containing 682 amino acids in a single polypeptide chain? What is transamination reaction? 2+3+3+2=10

(c) Draw and describe the 'Watson and Crick's' model of DNA structure. Compare between A, B and Z DNA. 6+4=10

(d) Derive the Michaelis-Menten equation for enzyme action with proper explanation. What is meant by allosteric enzyme? 8+2=10
