

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

- Name one structural isomer of glucose with structure.
- What is the metabolic fate of lactate in mammalian cells?
- What are sphingolipids? Give one example.
- What is amino sugar? Give an example.
- What forces hold protein subunits in a tertiary and quaternary structure?
- What is 'hyperchromic shift' of DNA?
- Name and draw the structure of pentose sugar found in RNA.
- What is isozyme? Cite example.

Group-B

2. Answer any two questions:

5×2=10

- What is the overall pathway in glycolysis? What are the possible metabolic fates of pyruvate?
3+2=5
- Discuss the reactions of urea-cycle. In which organ arginase is present?
4+1=5
- 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
- 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? $8+2=10$