

## FACULTY OF SCIENCE

M. Sc. I – Semester (CBCS) Examination, December 2016

Subject : Biochemistry

Paper – II : Chemistry and Metabolism of Carbohydrates, Nucleic Acids and Vitamins

Time : 3 Hours

Max. Marks: 80

Note : Answer all questions from Part–A and Part–B. Each question carries 4 marks in Part–A and 12 marks in Part – B.

**PART – A (8 x 4 = 32 Marks)**  
(Short Answer Type)

- 1 Draw the structure of one 6-carbon pyranose and one 6-carbon furanose. Describe one chemical test that distinguish between it two.
- 2 What are glycosaminoglycans? Give two examples and state their functions.
- 3 Discuss the role of fructose 2, 6 bisphosphate in the regulation of glycolysis.
- 4 How is glycogen break down regulated?
- 5 Indicate any two steps in purine nucleotide biosynthesis that is regulated by feedback mechanism.
- 6 Draw the Watson-Crick law pairing for the dinucleotide dAdC : dTdG.
- 7 Name two enzymes that use biotin as cofactor and write the reaction catalyzed by their enzymes.
- 8 State the food source and deficiency symptoms associated with  
(a) Ribflavin (b) Vitamin K.

**PART – B (4 x 12 = 48 Marks)**  
(Essay Answer Type)

- 9 (a) Describe the bacterial cell wall structure.  
OR  
(b) Discuss the factors that affect the folding of homo-polysaccharides starch and glycogen. Compare and contrast their structures.
- 10 (a) Describe the C<sub>3</sub> and C<sub>4</sub> cycle in plants.  
OR  
(b) Fate of Glucose-6-phosphate is linked to the need for NADPH ribose – 5- p and ATP. Justify this statement.
- 11 (a) Describe the complete biosynthetic pathway with intermediates and enzymes involved for CTP. Describe how the pathway is regulates.  
OR  
(b) Discuss the following features of DNA  
(i) Supurcoiling (ii) R-loops (iii) Tm and Cot analysis
- 12 (a) Describe the source, biological role and deficiency symptoms associated with any three fat soluble vitamins.  
OR  
(b) Describe the biological role of any five water soluble vitamins and symptoms associated with their deficiency.

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