Five-Year Integrated M. Sc. Examination 2021-2022
Semester: V
Paper: LS-3-5-2
Metabolism of Carbohydrates, Proteins, Lipids and Nucleic acids

Time: Four Hours **Full Marks: 80**

Questions are of value as indicated in the margin.
Answer ***Question No. 1*** and ***any six*** from the rest.

1. Answer ***any ten*** of the following: 2x10 = 20

   a) Compare the structural features of starch and glycogen.
   b) Give the reaction catalyzed by phosphoglucomutase and explain its catalytic mechanism.
   c) What is glycogenin?
   d) Which is the principal regulatory enzyme of glycolysis and why? Name its allosteric regulators.
   e) What are reducing sugars? Give two examples of reducing disaccharides with structures.
   f) What is pmf?
   g) What is salvage nucleotide biosynthesis?
   h) What is the clinical significance of uric acid?
   i) What is the cause of hyperammonemia?
   j) What do you mean by glucogenic amino acids?
   k) Write the functions of cytochrome P450 group of enzymes.
   l) What are chylomicrons?

2. What are deoxyribonucleotides? How are these synthesized? Describe the *de novo* biosynthesis of purine deoxyribonucleotides. 1+2+7=10

3. How is glycogen broken down in the liver to replenish blood glucose in times of need? 10

4. Where and when does gluconeogenesis occur? Describe the pathway of gluconeogenesis. 2+8=10

5. What is chemi-osmotic model? Elucidate the rotational catalytic mechanism of mitochondrial ATP synthase. 2+8=10

6. Explain carnitine shuttle. Discuss the beta-oxidation of fatty acids. 5+5=10

7. Write down the digestion and absorption of protein in human digestive system. What do you know about lactose intolerance? 8+2 = 10

8. What do you mean by transamination? State about the oxidative deamination of glutamate. Give a note on Phenylketonuria. 2+4+4 = 10

9. How fatty acids are activated and transported to the mitochondria? Write the key differences between fatty acid synthesis and breakdown. Give an account of the regulation of cholesterol biosynthesis. 3+3+4 = 10