Shahjalal University of Science & Technology, Sylhet
Department of Biochemistry and Molecular Biology
B. Sc. (Hons) 2nd Year 1st Semester Final Examination, 2013
Course No. : BMB -222 Course Title: Metabolism- I
Credit: 4.0 Total marks: 70 Time: 3 hours

Instructions:

- *Number in the right side indicates the marks of the question.*
- *Marks for each question are same.*
- *Answer any two (2) questions from each Part (A and B).*

PART-A

1. a. Define metabolism and metabolites. Write down the basic characteristics of metabolic pathway. 4
   b. What is high energy compound? Give examples. 3
   c. Show the utilization of ATP in energy conversion in firefly. 3
   d. Explain how the electrons transferred in biological oxidation reaction? 3.5
   e. What is GLUT? Write down different types of GLUT with their location in tissues and function. 4

2. a. Give the list of electron carriers in oxidative phosphorylation. 2
   b. Discuss the method for determining the sequence of electron carriers. 4
   c. Briefly describe the multienzyme complex which is involved in the electron carriers of the respiratory chain. 5
   d. What is galactosemia? Write down the causes and complications of galactosemia. 4
   e. Write down the regulation of TCA cycle. 2.5

3. a. Describe the steps involved in cholesterol biosynthesis. 6
   b. What is LDL? Discuss the roles of LDL in cholesterol metabolism. 4
   c. Discuss the role of biotin in gluconeogenesis. 3.5
   d. Draw the structures and give functions of: i) Cardiolipin; ii) Platelet activating factor. 4

PART-B

4. a. Define the following terms: 3
      i) Glycolysis;
      ii) Catabolism;
      iii) Apolipoproteins.
   b. Show with block diagram the energy relationship between catabolic and anabolic pathway. 3.5
   c. Describe the difference between heterotrophs and autotrophs. 3
   d. What is covalent modification? Show that glycogen breakdown is regulated by covalent modification. 4
   e. What is feedback inhibition? Show that ATP energies active transport. 4

5. a. Describe the oxidative carboxylation pathway of pyruvate 4
   b. State the roles of F-2, 6-BP (Fructose-2, 6- bisphosphate) in glycolysis and gluconeogenesis. 4
   c. How pyruvate dehydrogenase deficiency occurs and what's the treatment of this deficiency? 3.5
   d. Discuss the effect of oxygen supply on glycolytic rates. 3
   e. Give short notes on the regulation of glycogenolysis. 3

6. a. Discuss the fatty acid degradation in mitochondrial inner membrane. 5
   b. Briefly describe the transportation of long chain fatty acid into the mitochondria. 3
   c. What are ketone bodies? Write down the formation of ketone bodies from acetyl-CoA with reactions. 4.5
   d. What is ketonuria? Explain the diabetic ketoacidosis. 3
   e. What do you mean by α-oxidation? 2