Shah Jalal University of Science & Technology, Sylhet
Department of Biochemistry and Molecular Biology
B. Sc. (Hons) 1st year 1st Semester Examination, 2011
Course No. : **BMB -121** Course title: **Introductory Biochemistry**
Credit: **3** Total marks: **70** Time: **3** hours
Answer any two (2) questions from each Part (A and B).

Part A

1. (a) Mention one important contribution made by each of the following scientist in the development of biological science. 4
(i)Louis Pasteur, (ii) J watson and F Crick, (iii) A Vonleewenhock (iv) F.Sanger.
(b) Write down the biological function of carbohydrate. 3
(c) Explain why D-glucose shows mutarotation in solution. 3
(d) Explain how you can prove whether a monosaccharide exists in the pyranose or the furanose form. 4
(e) Discuss the function and structural properties of cellulose and chitin. 3.5

2. (a) Define with examples the following terms 4
(i)Epimer, (ii) Anomer ,(iii) N-glycoside ,(iv) glycans
(b) Describe the structure of amylase and amylopectin. Give their colour test with iodine. 5
(c) Discuss how starch and glycogen serve storage polysaccharide. 6
(d) How would you detect the presence of glucose in the diabetic patient? Justify your answer 2.5

3. (a) Define fat .Write down a chemical fact for identification of fat. 4
(b) Classify lipid and mention example of each class. 4
(c) Write down the name and structure of the followings 4
(i) choline containing phospholipid . (ii) spingosine containing lipid.
(iii) ω-3 fatty acid. (iv) simple Triacylglycerol.
(d) "Triacylglycerol provides stored energy"-justify this statement. 1.5
(e) Write down the biological function of essential fatty acid. 4

Part B

4. (a) Discuss the biological importance of protein with specific example. 4
   (b) Characterize the peptide bond. Name three naturally occurring peptide. 3
   (c) Write the structure and name of the followings 7
   (i) an amino acid with two basic group (ii) indole group containing amino acid
   (iii) amino acid with 2 asymmetric carbon
   (iv) an amino acid with a sulfhydral group. (v) an amino acid not present in protein.
   (vi) an acidic amino acid. (vii) a guanido group containing amino acid.
   (d) How do you determine cystein and arginine in an amino acid solution? 3.5

5. (a) Characterize α-helix structure and explain with example. Why some amino acids support α-conformation others do not. 5
   (b) Draw the oxygen saturation curve of hemoglobin and explain that hemoglobin is an allosteric protein. 6
   (c) What is sickle cell anemia? What its relation with primary structure of hemoglobin? 3
   (d) Write short notes on protein hydrolysis and separation of amino acids by ion exchange chromatography. 3.5

6. (a) Discuss the principle of SDS-PAGE and explain its use for determination of the molecular weight of an unknown protein. 6
   (b) Explain how gel filtration techniques can be used for the separation of smaller protein than larger one. 4
   (c) Show two methods for the determination of N-terminal amino acids of a polypeptide. 3
   (d) Define: (i) conjugated amino acids 4.5
   (ii) essential amino acids
   (iii) dipolar ion