Shahjalal University of Science & Technology, Sylhet
Department of Biochemistry and Molecular Biology
B. Sc. (Hons) **2nd Year 1st Semester** Final Examination, **2014**
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.	What is intermediary metabolism? Diagrammatically show the intermediary metabolism.	3.0
	b.	Explain the energy charge with possible diagram.	3.0
	c.	Write down the payoff steps of glycolytic pathway.	4.0
	d.	What do you mean by isozyme? Discuss the isozymes of Hexokinase enzyme.	3.0
	e.	Illustrate the conversion of pyruvate to acetyl-CoA by pyruvate dehydrogenase complex.	4.5
2.	a.	Demonstrate the action of different enzymes during glycogen breakdown.	5.0
	b.	Discuss the effects of GSK3 on glycogen synthase activity.	4.0
	c.	"TCA cycle is a metabolic hub."- Justify.	3.0
	d.	Briefly discuss the importance of Citrate as ion chelator.	3.0
	e.	Discuss the hypoglycemic condition in premature infants.	2.5
3.	a.	Write down Von Gierke's and Pompe's disease with their affected enzyme, organ and symptoms.	4.0
	b.	How Galactose enter the glycolytic pathway? Write down the pathway.	3.0
	c.	What is gluconeogenesis? Write down the bypass reactions of gluconeogenesis.	4.5
	d.	Outline the reactions of pentose phosphate pathway.	4.0
	e.	Why pentose phosphate pathway is important of red blood cells?	2.0

PART-B

4.	a.	Illustrate the metabolic pathway for the synthesis of squalene from acetate.	7.0
	b.	What is phospholipid? Show the synthesis of phosphatidylcholine from glycerol-3-phosphate.	1.0+4.0
	c.	Provide the synthesis of PGH_2 and TXB_2 from Arachidonic acid.	5.5
5.	a.	Why did you need fat for storing energy when glycogen can act as energy fuel?	1.5
	b.	Schematically show the biosynthetic pathway for the synthesis of palmitate from acetyl-CoA.	5.0
	c.	What are ketone bodies? Show the synthesis and utilization of ketone bodies.	1+2.5+2.5
	d.	Show the regulation of fatty acid breakdown.	2.0
	e.	"Carnitine carries the acyl groups across the inner mitochondrial membrane."- Explain the statement.	3.0
6.	a.	What is oxidative phosphorylation? Describe the methods used for the determination of the sequence of the electron carrier of the Electron Transport Chain (ETC).	1.0+3.0
	b.	Describe the chemiosmotic model of ATP synthesis in ETC.	4.0
	c.	What is brown adipose tissue? Explain the heat generation in adipose tissues.	2.0+3.0
	d.	What is Reactive Oxygen Species (ROS)? How did the ROS produced in electron transport chain neutralized?	1.0+2.5
	e.	Even when rotenone is used to block the carrier of ETC the organism can produce ATP, explain how?	1.0