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Name:	
Roll No.:	An Annual (Villemaning) and Explanat
Invigilator's Signature :	

CS/B.TECH (BT)(N)/SEM-3/BT-302/2012-13

2012

BIOCHEMISTRY

Time Allotted: 3 Hours Full Marks: 70

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

GROUP - A

			(Mui	tipie C	MOIC	e ryp	ie Qu	lestion	s j		
1.	Cho	Choose the correct alternatives for the following : $10 \times 1 = 10$									
	i)	The	net	gain	of	ATP	mol	ecules	resul	lting	from
		Gly	colysis	is			λ				
		a)	2				b)	4			
		c)	36				d)	38.			
ii) TCA cycle takes place at											
		a)	nucle	eous			b)	mitocl	hondri	.a	
		c)	cytos	ol			d)	chlore	plast.		
iii) The storage form of carbohydrate in anima									mal is	j	
		a)	starc	h			b)	cellulo	ose		
		c)	glyco	gen			d)	glucos	se.		
	iv)	The largest energy reserve (kilocalories) in humans is							is		
		a)	blood	glucos	se						
		b)	liver	glycoge	n						
		c)	musc	ele glyc	ogen						
		d)	adipose tissue triglyceride.								

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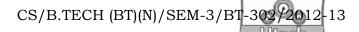


- v) The coenzyme involved in transfer of carboxyl group
 - a) NADH
 - b) coenzyme A
 - c) S-adenosyl methionine
 - d) biotin.
- vi) Acyl Carrier Protein takes part in
 - a) amino acid degradation
 - b) glycolysis
 - c) fatty acid biosynthesis
 - d) fatty acid degradation.
- vii) The molecule which does not contain a high-energy bond is
 - a) ATP

b) AMP

c) ADP

- d) ppi.
- viii) Glycolytic pathway regulation involves
 - a) allosteric stimulation by ADP
 - b) allosteric inhibition by ATP
 - c) feedback, or product, inhibition by ATP
 - d) all of these.
- ix) Glycogen has
 - a) α -1, 4 linkage
 - b) α -1, 6 linkages
 - c) α -1, 4 and α -1, 6 linkages
 - d) α -1, 4 and β -1, 6 linkage.
- x) The lipid bilayer is impermeable to
 - a) hydrocarbons
 - b) hydrophobic molecules
 - c) small uncharged polar molecules
 - d) large uncharged polar molecules.



GROUP - B

(Short Answer Type Questions)

Answer any three of the following

 $3 \times 5 = 15$

- 2. How Vibrio cholerae toxin reacts with our body?
- 3. Describe in brief the process of omega oxidation.
- 4. What is glyoxylate cycle ? Name two key enzymes of glyoxylate cycle and write the reactions catalyzed by these enzymes.

 1 + 4
- 5. What do you mean by transamination? Discuss the role of vitamin B_6 in transamination. 2 + 3
- 6. Discuss the induced fit hypothesis to describe the enzymeaction.

GROUP - C

(Long Answer Type Questions)

Answer any *three* of the following.

 $3 \times 15 = 45$

- 7. a) Calculate how many ATPs are formed by complete β oxidation of one molecule of stearic acid.
 - b) Discuss catabolism of arginine.
 - c) What do you mean by oxidative deamination?
 - d) Give a brief account on disorders of purine nucleotide metabolism. $5 + 2\frac{1}{2} + 2\frac{1}{2} + 5$
- 8. a) What is signal transduction?
 - b) What are the different types of receptors involved in cell signaling?
 - c) How G protein is activated by epinephrine?
 - d) What are second messengers? Name two second messengers molecules. 3 + 4 + 4 + 4

CS/B.TECH (BT)(N)/SEM-3/BT-302/2012-13



- 9. a) How do PRPP levels influence purine and pyrimidine nucleotide synthesis?
 - b) How are folate cofactors involved in nucleotide metabolism?
 - c) What is glutathione? Describe its synthesis and function in cell. 4 + 5 + 6
- 10. a) What are the differences between Oxidative and Reductive pentose phosphate pathway.
 - b) Give the other names of these pathways.
 - c) Explain with the help of a schematic diagram the PPP pathway of a cell.
 - d) Does this pathway occur in all cells?
 - e) Give at least two importance of this pathway.

3 + 2 + 8 + 1 + 1

- 11. a) What is oxidative phosphorylation? Write the sequence of electron carriers in the respiratory chain?
 - b) State and explain chemiosmotic coupling hypothesis.
 - c) Name two inhibitors of electron transport chain and show where they are acting? 2 + 5 + 4 + 4
