



Name : .....

Roll No. : .....

Invigilator's Signature : .....

**CS/B.Tech (FT-NEW)/SEM-4/FT-401/2013**

**2013**

**BIO-CHEMISTRY AND NUTRITION**

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**

**( Multiple Choice Type Questions )**

1. Choose the correct alternatives for any *ten* of the following : 10 × 1 = 10

i) Which of the following is acidic amino acid ?

- |        |                  |
|--------|------------------|
| a) Ala | b) Gly           |
| c) Asp | d) All of these. |

ii) Example of essential amino acid is

- |        |                  |
|--------|------------------|
| a) Ala | b) Gly           |
| c) Val | d) All of these. |

iii) The best example of PUFA is

- |                  |                    |
|------------------|--------------------|
| a) Palmitic acid | b) Lauric acid     |
| c) Oleic acid    | d) Linolenic acid. |



iv) The protein component of an enzyme, to which the coenzyme is attached, is called

- a) apoenzyme
- b) prosthetic group
- c) isoenzyme
- d) all of these.

v) Ribose sugar is present in

- a) LDL
- b) Ferritin
- c) RNA
- d) Phospholipid.

vi) Major metabolic product of pentose phosphate pathway is

- a) Ribose-5-phosphate
- b) Xylulose-5-phosphate
- c) Erythrose-4-phosphate
- d) None of these.

vii) Oxidative phosphorylation takes place in

- a) Cell wall
- b) Cytoplasmic membrane
- c) Mitochondrial matrix
- d) Nuclear material.





xiii) In TCA cycle TCA refers to

- a) Citric acid
- b) Lactic acid
- c) Pyruvic acid
- d) Succinic acid.

xiv) Which of the following is a saturated fatty acid ?

- a) Linolenic acid
- b) Stearic acid
- c) Linoleic acid
- d) None of these.

xv) Arginine is an example of

- a) acidic amino acid
- b) basic amino acid
- c) basic and essential amino acid
- d) non-essential amino acid.



**GROUP – B**

**( Short Answer Type Questions )**

Answer any *three* of the following.

3 × 5 = 15

2. The activities of enzymes depend upon pH and temperature. Justify.
3. Explain the following terms :
  - i) EAA
  - ii) NPU
  - iii) Chemical score.
4. Write short notes on any *two* of the following :  $2 \times 2\frac{1}{2}$ 
  - a) Amino acid pool
  - b) Biological significance of Vitamin A
  - c) Nitrogen balance
  - d) Regulatory functions of proteins.
5. Distinguish between lock and key model and induced fit model of enzymatic reaction.
6. What are proteins ? Are they similar with amino acids ? Give example of non-protein nitrogen compound, biologically active peptide, anti-nutrient. What is meant by the term 'good quality protein' ?
7. What do you mean by protein structure ? What are the enzymes responsible for protein metabolism ? Discuss.

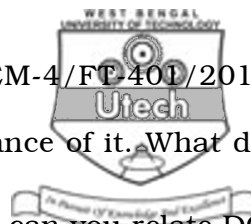


**GROUP – C**

**( Long Answer Type Questions )**

Answer any *three* of the following.  $3 \times 15 = 45$

8. Write three major properties of carbohydrates. Briefly describe different steps of glycolysis showing ATP generation. With the help of structure show why sucrose is non-reducing sugar.  $3 + 9 + 3$
9. What is  $\beta$  oxidation ? Show ATP yield for palmitate ( $C_{16}$ ) by  $\beta$  oxidation.  $7 + 8$
10. What are the importances of Vitamin A ? What is its source ? What is the role of Calcium in human body ? What are the deficiency syndromes of Vitamin C ? Write scientific names of Vitamin B2 & Vitamin E.  $3 + 3 + 3 + 4 + 2$
11. Write Michelis-Menten equation for an enzyme reaction. Define  $K_m$  and  $V_{max}$ . Write the significance of M.M. graph. The plot of Michelis-Menten equation follows 1st order and zero order kinetics. Justify.  $6 + 2 + 2 + 5$



12. What is Ornithin cycle ? Give the significance of it. What do you mean by good quality of protein ? How can you relate DC value with the protein quality ? What is protein nitrogen ? What is the basic difference of non-protein nitrogen with protein N ? Give examples of some protein N and non-protein N substances.

7 + 4 + 4

13. Write on transamination and decarboxylation reactions, allosteric modification classification of enzyme.

5 + 5 + 5

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