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 : $10 \times 1 = 10$

   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-phophate

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.

viii) The inhibitory substance in electron transport chain is

a) Hg b) Bromide ion

c) Cyanide ion d) None of these.

ix) Carotene is a precursor of

a) Vitamin *A* b) Vitamin *B*

c) Vitamin *C* d) Vitamin *D*.

x) Fructose is a

a) Monosaccharide b) Disaccharide

c) Polysaccharide d) None of these.

xi) Glycolysis is

a) Catabolic pathway of fats

b) Anabolic pathway of carbohydrate

c) Anaerobic breakdown of glucose

d) Aerobic breakdown of glucose.

xii) Vitamin B_1 is also known as

a) Riboflavin b) Tocopherol

c) Thiamine d) Ascorbic acid.

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. $3 \times 5 = 15$

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 × 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 β oxidation ? Show ATP yield for palmitate $\left(C_{16}\right)$ by β 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 *B*2 & 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 modificatioin classification of enzyme. 5 + 5 + 5