Name : .....

Roll No. : .....

Invigilator's Signature : .....

CS/B.TECH (FT)-NEW/SEM-4/FT-401/2012

2012

BIOCHEMISTRY & 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) Example of a cobalt containing vitamin is

a) Vitamin *A* b) vitamin *C*

c) Vitamin B_6 d) Vitamin B_{12} .

ii) The molecular weight of β-Casein is

a) 23400 b) 21000

c) 24000 d) 66000.

iii) The end product of Glycolysis is

a) fructose-1, 6-biphosphate

b) Phosphoenol Pyruvate

c) Pyruvic acid

d) None of these.

iv) Acetyl Co-A formed in T.C.A. cycle is due to the influence of the enzyme

a) α-KG dehydrogenase

b) fumerase

c) Pyruvate decarboxylase

d) Succinate dehydrogenase.

v) Overall energy production in Krebs cycle is

a) 39 mol. of ATP b) 24 mol. of ATP

c) 30 mol. of ATP d) None of these.

vi) Lysine is an example of

a) acidic amino acid

b) basic amino acid

c) basic and essential amino acid

d) non-essential amino acid.

vii) Peptide bonds are found in

a) urea b) uric acid

c) insulin d) all of these.

viii) Vitamin B_{12} is also known as

a) Ascorbic acid b) Retinol

c) Riboflavin d) None of these.

ix) One molecule of beta-carotene produces after synthesis

a) one molecule of vitamin *A*

b) two molecules of vitamin *A*

c) three molecules of vitamin *A*

d) six molecules of vitamin *A*.

x) The chief constituent of ketone bodies will be

a) Ethyl alcohol b) Ethyl acetoacetate

c) Acetic acid d) none of these.

xi) Precursor of dopamine is / are

a) tyrosine b) glycine

c) alanine d) all of these.

xii) The sulphur contamining amino acid is

a) leucine b) isolecine

c) lysine d) metheonine.

xiii) In saliva the nature of enzyme present is

a) protein degrading

b) carbohydrate degrading

c) lipid degrading

d) crude fibre degrading.

xiv) Calcium absorption in the human system is enhanced by

a) Vitamin *A* b) Vitamin *D*

c) Vitamin *K* d) None of these.

xv) Fatty Liver is formed due to the deficiency of

a) Alanine b) Bile salt

c) Choline d) Cholesterol.

GROUP – B

(Short Answer Type Questions)

Answer any *three* of the following. 3 × 5 = 15

2. Write down the flow path of the Priming stage of Glycolysis. Calculate the total energy yield of glycolytic pathway. 3 + 2

3. What is Gluconeogenesis ? Write down the site of Gluconeogenesis. Differentiate between Glycolysis and Gluconeogenesis. 2 + 1 + 2

4. Narrate the fates of pyruvate under aerobic and anaerobic conditions. Describe Cori Cycle. 2 + 3

5. What do you mean by the term 'Class I protein' ? Give two examples of foods which can be served as the best sources of class I protein. 3 + 2

6. What is termed as specificity of an enzymatic reaction ? Explain with proper example. What is meant by enzymatic activity ? 2 + 1 + 2

7. Write three main properties of fatty acid in human nutrition. What is the importance of fish oil for prevention of cardiovascular diseases ? 3 + 2

GROUP – C

(Long Answer Type Questions)

Answer any *three* of the following. 3 × 15 = 45

8. Write three major properties of carbohydrates. What is the importance of Pentose Phosphate Pathway ? How is glycogen formed from glucose in our body ? Show the type of glycosidic linkage present in (a) Sucrose, (b) Lactose and comment on their reducing property. 3 + 3 + 4 + 2 + 2 + 1

9. What is β-oxidation ? Show ATP yield for Palmitate (C_{16}) by β-oxidation. 7 + 8

10. What are the importances of Vitamin B_1 ? What is its source ? What is meant by balanced food ? Which are the constituents that must remain present in such a food ? Discuss about allosteric enzymes. 3 + 3 + 4 + 5

11. Write Michaelis-Menten equation for an enzyme reaction. Mention the significance of M.M. graph. Define K_m and V_{max} . The plot of Michaelis-Menten equation follow 1st order and zero order kinetics. Justify. 6 + 2 + 2 + 5

12. What do you mean by cofactor, apoenzyme and holoenzyme ? How the activities of enzymes depend upon pH and Temperature ? What is Turnover number ? Discuss about Khoshland induced fit model for enzyme activity. Name the substrates and products formed when the following enzymes act :

    a) Invertase

    b) Xylanase

    c) Lipase. 3 + 4 + 2 + 3 + 3

13. Mention the scientific names, sources and biological function of the vitamins *A, D, K,* folic acid and pyridoxin. 3 × 5

14. Discuss the physiological roles of copper, magnesium, chlorine, calcium and sodium. 5 × 3