



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 × 1 = 10

i) Example of a cobalt containing vitamin is

- |                           |                              |
|---------------------------|------------------------------|
| a) Vitamin A              | b) vitamin C                 |
| c) Vitamin B <sub>6</sub> | d) Vitamin B <sub>12</sub> . |

ii) The molecular weight of  $\beta$ -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)  $\alpha$ -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 containing amino acid is

- |            |                |
|------------|----------------|
| a) leucine | b) isoleucine  |
| c) lysine  | d) methionine. |



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

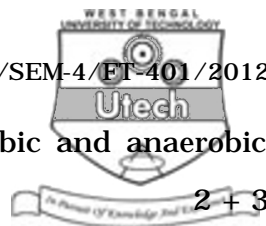
- a) Alanine
- b) Bile salt
- c) Choline
- d) Cholesterol.

### GROUP - B

#### ( Short Answer Type Questions )

Answer any *three* of the following.  $3 \times 5 = 15$

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.  $2 + 1 + 2$



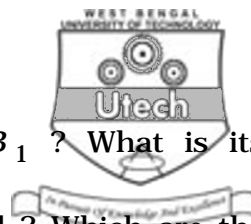
4. Narrate the fates of pyruvate under aerobic and anaerobic conditions. Describe Cori Cycle. 2 + 3
5. What do you mean by the term 'Class I protein' ? Give two examples of foods which can be served as the best sources of class I protein. 3 + 2
6. What is termed as specificity of an enzymatic reaction ? 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  $\beta$ -oxidation ? Show ATP yield for Palmitate (  $C_{16}$  ) by  $\beta$ -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

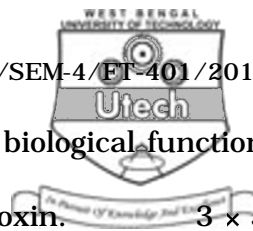
12. What do you mean by cofactor, apoenzyme and holoenzyme ? How the activities of enzymes depend upon pH and Temperature ? What is Turnover number ? Discuss about Khoshland induced fit model for enzyme activity. Name the substrates and products formed when the following enzymes act :

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.  $3 \times 5$

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

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