M.TECH. DEGREE EXAMINATIONS: DECEMBER – 2008

First Semester

BIOTECHNOLOGY

P07BTB11 BIOCHEMISTRY

Time: Three Hours   Maximum Marks: 100

Answer ALL Questions:-

PART A (20 x 1 = 20 Marks)

1. Galactose and glucose are

    (A) Enantiomers   (B) Epimers   (C) Isomers   (D) Anomers

2. Which of the following is not an α-amino acid?

    (A) Ala   (B) Gly   (C) Phe   (D) Pro

3. Proteins are precipitated and purified by fractional precipitation using

    (A) Ferrous sulfate   (B) Calcium sulfate
    (C) Ammonium sulfate   (D) Ammonium nitrate

4. According to Michaleis-Menten equation which of the following is correct

    (A) $Vo = \dfrac{Vmax\,[s]}{Km + [s]}$ (B) $Vmax = \dfrac{Km + [s]}{Vo}$

    (C) $Km = \dfrac{Vo}{[s]}$ (D) $Vo = \dfrac{[s]}{Km}$

5. Pyruvate is the end product of

    (A) HMP shunt   (B) Glyoxylate cycle (C) Krebs cycle   (D) Glycolysis

6. Cytochrome C oxidase is poisoned by

    (A) Sulphide   (B) Sulphite   (C) Cyanide   (D) Sulphate

7. Electron transport chain occurs in the

    (A) Peroxisome   (B) Mitochondrion   (C) Lysosome   (D) Glyoxysome

8. Lowering of 'activation energy' in a biochemical reaction is done by

    (A) Catalyst   (B) Enzyme   (C) Coenzyme   (D) Ribozyme

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9. The chemical linkage found in sucrose is

    (A) $\alpha\ 1 \rightarrow 2$ (B) $\alpha\ 1 \rightarrow 4$ (C) $\beta\ 1 \rightarrow 2$ (D) $\beta\ 1 \rightarrow 4$

10. Photo systems I and II operate in

   (A) Golgi bodies   (B) Peroxisomes (C) Chloroplasts   (D) Endoplasic reticula

11. The number of ATPs generated by $NADHH^+$ in electron transport chain is

   (A)   2   (B) 2.5
   (C)   1   (D) 3.5

12. In human beings, fatty acids

   (A) can be synthesized from excess dietary carbohydrates or protein

   (B) are not required at all in the diet

   (C) must be supplied entirely by the diet

   (D) other than saturated fatty acids must be supplied in the diet

13. Which one of the following pathways is anaplerotic in nature?

   (A) HMP shunt   (B) *Glycolysis*
   (C) Tricarboxylic acid cycle   (D) *Glyconeogenesis*

14. Which is the energy currency of the cell, precisely?

   (A) GTP   (B) ATP   (C) (A) and (B)   (D)   TTP

15. A key metabolic junction intermediate is

   (A) Glucose   (B) NADP   (C) Acetyl COA   (D) Cyclic AMP

16. Which one of the following not a constituent of a membrane lipid

   (A) Cardiolipin   (B) Phospholipid   (C) Cholesterol   (D) Carotene

17. A technique to study cell membrane structure is

   (A) Lipid analysis   (B) Freeze fracture

   (C) Gas Chromatography   (D) Electrophoresis

18. The number of milliliters of 0.1 N KOH required to neutralize the insoluble fatty acids from 5 g of fat is called

   (A) Acid number (B) Acetyl number (C) Iodine number (D) Polenske number

19 α-helix of protein is stabilized by

   (A) Hydrogen bonds   (B) Disulphide bonds

   (C) Salt bonds   (D) Hydrophobic bonds

20. A buffer system in the blood is

   (A) Formic acid-formate   (B) Albumin-globulin

   (C) HCl-NaCl   (D) HCO_3-CO_2

PART B (5 x 16 = 80 Marks)

21. (a). Write in detail on starch structure and its function as a reservoir of chemical energy

(OR)

 (b). Explain the structure of a protein at four different levels

22. (a) (i) What is a buffer and how it functions?   8

 (ii) Write on any three buffer systems of blood   8

(OR)

 (b). What are different ways of enzymes regulations?

23. (a). Describe Calvin cycle with suitable chemical structures

(OR)

 (b). (i) Write on electron transport chain   8

 (ii) Explain proton pump and ATP synthesis   8

24. (a) What do you mean by metabolic disorder? Write on any three such disorders

(OR)

 (b). Explain metabolic engineering with a suitable example

25. (a). Describe "fluid mosaic model" of membrane and how active transport takes place across membrane?

(OR)

 (b) Write on bioenergetics and its importance

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