

# BIOCHEMISTRY- 2010

M.Sc. Biochemistry

- In case of an isochoric process, if the change in enthalpy is 50 kJ/mole, the change in internal energy will be :
  - 30 kJ/mole
  - 50 j/mole
  - 30 j/mole
  - 50 kJ/mole
- Dissolution of NaCl in water will lead to :
  - Decrease in entropy
  - Increase in entropy
  - No change in entropy
  - None of the above
- The stabilities of oxygen molecular ions with respect to oxygen molecule follow the order :
  - $O_2^{2+} > O_2^+ > O_2 > O_2^- > O_2^{2-}$
  - $O_2^{2+} > O_2 > O_2^+ > O_2^- > O_2^{2-}$
  - $O_2^{2-} > O_2^+ > O_2 > O_2^- > O_2^{2+}$
  - $O_2^{2+} > O_2^+ > O_2 > O_2^{2-} > O_2^-$
- In general, if the electronegativity difference between two combining atoms is equal to 1.9, the bond has :
  - 100% ionic character
  - 100% covalent character
  - 50% covalent character and 50% ionic character
  - 75% ionic character and 25% covalent character
- Ortho-nitro phenol has less boiling points than Para-nitro phenol because :
  - Ortho-nitro phenol has intra-molecular hydrogen bonding while Para-nitro phenol has inter-molecular hydrogen bonding
  - Ortho-nitro phenol has inter-molecular hydrogen bonding while Para-nitro phenol has intra-molecular hydrogen bonding
  - Ortho-nitro phenol has weak hydrogen bonding while Para-nitro phenol has strong hydrogen bonding
  - The statement has nothing to do with hydrogen bonding
- The number of stereoisomers possible for open chain structure of Glucose are :
  - 8
  - 12
  - 16
  - 2
- The correct order of equivalent conductance at infinite dilution of LiCl, NaCl and KCl is :
  - LiCl > NaCl > KCl
  - LiCl = NaCl < KCl
  - NaCl > LiCl > KCl
  - KCl > NaCl > LiCl

8. A buffer solution may be prepared by adding equal volumes of 0.2 M  $\text{NH}_4\text{OH}$  and 0.02 M  $\text{NH}_4\text{Cl}$ . If the  $\text{p}K_b$  of the base is 5, the pH of the resulting solution will be :
- (a) 5 (b) 9  
(c) 10 (d) 7
9. Triton X-100 is a :
- (a) Cationic detergent (b) Anionic detergent  
(c) Both (a) and (b) (d) Non ionic detergent
10. The daily dietary requirement of copper for an adult male is :
- (a) 6-10 mg (b) 1.5-3 mg  
(c) 25-30 mg (d) 0.1-0.3 mg
11. Which of the following metal toxicity is responsible for Alzheimer's disease ?
- (a) Aluminium (b) Cadmium  
(c) Lead (d) Mercury
12. If 2 g of a radioactive isotope has  $T_{1/2}$  of 7 days, then half life of 1 g of the same sample shall be :
- (a) 14 days (b) 7 days  
(c) 3.5 days (d) 35 days
13. The number of peak(s) on NMR spectra of acetone will be :
- (a) 6 (b) 3  
(c) 1 (d) 2
14. The concentration of a DNA sample having  $A_{260\text{nm}} = 0.5$  and specific extinction coefficient = 200, will be :
- (a) 25  $\mu\text{g/ml}$  (b) 50  $\mu\text{g/ml}$   
(c) 12.5  $\mu\text{g/ml}$  (d) 40  $\mu\text{g/ml}$
15. The fixation and reduction of carbon dioxide in higher plants occurs in presence of :
- (a) ATP (b) ATP and NADPH  
(c) NADPH, chlorophyll and water (d) ATP, NADPH and light

16. While studying the catabolism of 18 carbon fatty acid, which of the following sets is the most appropriate ?
- (a) Cytosol,  $\beta$  oxidation, 140 ATP
  - (b) Cytosol,  $\beta$  oxidation, 146 ATP
  - (c) Mitochondria,  $\beta$  oxidation, 146 ATP
  - (d) Mitochondria,  $\beta$  oxidation, 140 ATP
17. The rate of transpiration in plants could be determined using the following instrument/s:
- (a) Photometer
  - (b) Colorimeter
  - (c) Both (a) and (b)
  - (d) Potometer
18. Osmotic pressure of pure water is :
- (a) Less than NaCl solution
  - (b) Greater than NaCl solution
  - (c) Same as that of the NaCl solution
  - (d) None of the above
19. The study of hydroponics refers to :
- (a) Determination of the water quality of a water body
  - (b) Evaluation of the role of a macronutrient or micronutrient under laboratory conditions
  - (c) Tissue culture technique
  - (d) None of the above
20. Ecology is the study of relationship of :
- (a) Soil and water
  - (b) Man and Environment
  - (c) Organisms and Environment
  - (d) Members of a family
21. The parameter Chemical Oxygen Demand is associated with :
- (a) Water pollution
  - (b) Air pollution
  - (c) Soil pollution
  - (d) Noise pollution
22. The importance of an ecosystem lies in :
- (a) Cycling of materials
  - (b) Flow of energy
  - (c) Both (a) and (b)
  - (d) Its biomass

23. Which of the following is not a distinguishing characteristic of prokaryotic cells ?
- They lack membrane bound organelles
  - They have cell walls containing peptidoglycan
  - Their DNA is not associated with histones
  - They lack a plasma membrane
24. All of the following are true about agar except :
- It is a source of nutrient in culture media
  - It is a polysaccharide
  - It liquefies at 100°C
  - It solidifies at approximately 40°C
25. A viral species is not defined on the basis of the disease symptoms it causes. The best example of this is :
- |               |             |
|---------------|-------------|
| (a) Polio     | (b) Rabies  |
| (c) Hepatitis | (d) Measles |
26. The discovery of the restriction enzymes firstly was with the observation that :
- DNA was restricted to the nucleus
  - Phage DNA was destroyed in a host cell
  - Foreign DNA was kept out of a cell
  - All of the above
27. Tick odd man out with respect to chemical nature of the substance :
- |                |             |
|----------------|-------------|
| (a) Hemoglobin | (b) Albumin |
| (c) Myosin     | (d) Inulin  |
28. Tick odd man out with respect to chemical properties of the substance :
- |             |             |
|-------------|-------------|
| (a) Glucose | (b) Maltose |
| (c) Lactose | (d) Sucrose |
29. The slowest enzyme present in nature is :
- |                        |                          |
|------------------------|--------------------------|
| (a) Catalase           | (b) Superoxide dismutase |
| (c) Carbonic anhydrase | (d) Lysozyme             |
30. In case of an un-competitive inhibition of enzymes :
- Both  $K_m$  and  $V_{max}$  decrease
  - Both  $K_m$  and  $V_{max}$  increase
  - $K_m$  decreases but  $V_{max}$  remains unchanged
  - $K_m$  remains unchanged but  $V_{max}$  decreases

31. A gene is a segment of the DNA molecule containing base pairs about :
- (a) 600
  - (b) 500
  - (c) 400
  - (d) 300
32. All t-RNA molecules have a common CCA sequence at the :
- (a) 3' termini
  - (b) 5' termini
  - (c) Both (a) and (b)
  - (d) None of the above
33. Colloidal Gold method is used for the estimation of :
- (a) Carbohydrates
  - (b) Nucleic acids
  - (c) Proteins
  - (d) Lipids
34. The nitrogenous base present in lecithin is /are :
- (a) Ethanolamine
  - (b) Choline
  - (c) Thymine
  - (d) All of the above
35. The molecular weight of proteins may be determined by the method/s :
- (a) SDS-PAGE
  - (b) Gel filtration chromatography
  - (c) Analytical ultracentrifugation
  - (d) All of the above
36. The presence of four bases in nucleic acids was first described by :
- (a) F. Miescher
  - (b) Albrecht Kossel
  - (c) Altman
  - (d) Emil Fischer
37. Post mitotic gap phase is :
- (a) S-phase
  - (b) Meiosis
  - (c) G<sub>1</sub>-phase
  - (d) G<sub>2</sub>-Phase
38. In African people, there is less uptake of oxygen due to a genetic disorder namely :
- (a) Haemophilia
  - (b) Anaemia
  - (c) Pernicious anaemia
  - (d) Sickle cell anaemia
39. Some recessive genes in human males express their effects because they have :
- (a) Only one Y-chromosome
  - (b) Only one- X chromosome
  - (c) Single genome
  - (d) Only two sex chromosomes
40. Which of the inhibitor/s inhibit/s the process of translation in mammalian system only ?
- (a) Chloramphenicol
  - (b) Puromycin
  - (c) Cycloheximide
  - (d) All of the above

41. Ames's test may be used to detect :
- |                      |                                    |
|----------------------|------------------------------------|
| (a) Amino acids      | (b) Nucleotides                    |
| (c) Both (a) and (b) | (d) The mutagenicity of a chemical |
42. In case of "Euploidy, there is :
- Addition of a complete set of chromosomes
  - Loss of few chromosomes
  - Multiplication of chromosomal number
  - None of the above
43. The 32-cell stage of the human embryo is :
- Smaller than the fertilized egg
  - Almost same size as the fertilized egg
  - Two times the size of the fertilized egg
  - Four times the size of the fertilized egg
44. Lack of synthesis of pulmonary surfactant produces :
- |                     |                                   |
|---------------------|-----------------------------------|
| (a) Cystic fibrosis | (b) Respiratory distress syndrome |
| (c) Asthma          | (d) Emphysema                     |
45. Under secretion of which of the following causes Addison's disease ?
- |                |                |
|----------------|----------------|
| (a) Adrenaline | (b) Corticoids |
| (c) ACTH       | (d) Insulin    |
46. The main significance of HMP shunt is that :
- It produces ATP
  - It produces NADPH and ATP for biosynthetic pathways
  - It produces NADPH and Ribose-5-phosphate for some biosynthetic pathways
  - All of the above
47. The structural arrangement  $(H_2L_2)_3$  is for the antibody :
- |            |            |
|------------|------------|
| (a) $I_gA$ | (b) $I_gD$ |
| (c) $I_gG$ | (d) $I_gM$ |
48. The technique used for the production of monoclonal antibodies is called as :
- |                                |                          |
|--------------------------------|--------------------------|
| (a) DNA recombinant technology | (b) Hybridoma technology |
| (c) Fermentation technology    | (d) All of the above     |

49. Which of the following is an uncoupling agent of oxidative phosphorylation ?
- (a) Penicillin (b) Antimycin A  
(c) Barbiturates (d) Dicoumarol
50. The urine of patient's suffering from Hartnup's disease contains highly increased amount of:
- (a) Tryptophan only (b) Indole acetic acid only  
(c) Tyrosine only (d) Both (a) and (b)
51. Cell wall rigidity is maintained by:
- (a) Pectin (b) Lignin  
(c) Suberia (d) Cutin
52. Human blood is thicker than water by a factor of:
- (a) 5 (b) 4  
(c) 3 (d) 2
53. The net ATPs produced during complete oxidation of palmitic acid through  $\beta$  oxidation are:
- (a) 146 (b) 131  
(c) 129 (d) 135
54. Phenylketonuria is due to the deficiency of which of the following enzymes ?
- (a) Deaminates tyrosine (b) Hydroxylates phenylalanine  
(c) Oxidizes homogentisic acid (d) Converts tyrosine to DOPA
55. SDA is associated with:
- (a) Proteins (b) Fats  
(c) Carbohydrates (d) All of the above
56. Which of the following vitamins, is not found in sterilized milk ?
- (a) Vit. A (b) Vit. B<sub>1</sub>  
(c) Vit. C (d) Vit. D
57. Which enzyme(s) is (are) drastically elevated in bone disease:
- (a) SGOT (b) SGPT  
(c) Alkaline phosphatase (d) All of the above

58. The E.C Code: 2.6.1.1 is for :
- |          |          |
|----------|----------|
| (a) SGPT | (b) SGOT |
| (c) LDH  | (d) CK   |
59. Indocyanine Green (ICG) is a rarely used test to detect the excretory function of :
- |              |             |
|--------------|-------------|
| (a) Liver    | (b) Kidney  |
| (c) Pancreas | (d) Gastric |
60. The widely used tool in genetic engineering of crop plants is :
- |                    |                                     |
|--------------------|-------------------------------------|
| (a) Microinjection | (b) Protoplast fusion               |
| (c) Transposon     | (d) <i>Agro bacterium mediation</i> |