NARAYANA EDUCATIONAL INSTITUTIONS

CHEMISTRY

BIOMOLECULES

1. Point out the wrong statement about proteins:
   1) They are nitrogenous organic compounds of high molecular masses
   2) On hydrolysis by enzymes, they give amino acids
   3) Many of them are enzymes
   4) They do not contain polypeptide linkages
2. The reagent used for the detection of proteins is:
   1) HNO_3(CONC.) 2) Fehling's solution 3) Tollens reagent 4) Baeyer's reagent
3. Biuret test is no given by:
   1) proteins 2) urea 3) polypeptide 4) carbohydrates
4. Diabetes is detected by testing urine of the patient with:
   1) Tollen's reagent 2) Nessler's reagent 3) Fenton's reagent 4) Benedict's solution
5. A metal which can form a complex with insulin is:
   1) copper 2) iron 3) zinc 4) cobalt
6. Glycogen is:
   1) a structural polysaccharide 2) a polymer of $\beta - D -$ glucose units
   3) structurally similar to amylopectin but extensively branched
   4) structurally very much similar to amylopectin
7. Identify the vitamin whose deficiency in our food decreases reproductive power:
   1) vitamin A 2) vitamin C 3) vitamin D 4) vitamin E
8. which of the following is least related to the other three?
   1) Galactose 2) Glucose 3) Mannose 4) Arabinose
9. Match List I with List II and pick the correct matching from the codes given below:

List I	List II
A. Thymine	1) Pyrimidine base
B. Thiamine	2) Enzyme
C. Insulin	3) Cell wall component
D. Pepsin	4) Hormone

E. Phospholipids 5) Vitamin B_1

Codes:

1) A-4, B-3, C-1, D-5, E-2 2) A-5, B-3, C-4, D-1, E-2

3) A-3, B-2, C-1, D-5, E-4 4) A-2, B-4, C-1, D-3, E-5

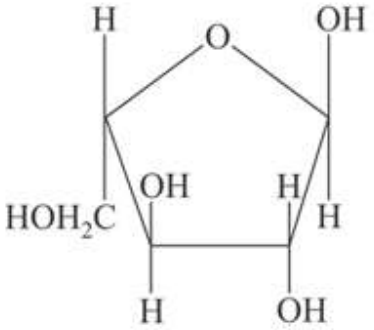
10. Which of the following disaccharide has different type of linkage?

1) Maltose 2) Galactose 3) Starch 4) Sucrose

11. The vitamin which is neither soluble in water nor in fat is:

1) biotin 2) Phylloquinone 3) thiamine 4) ergocalciferol

12. Which set of terms correctly identifies the carbohydrate shown?



1) Pentose 2) Hexose 3) Aldose

4) ketose 5)Pyranose 6)Furanose

1) 1,3 and 6 2) 1,3 and 5 3) 2,3 and 5 4) 2,3 and 6

13. A. $\xrightarrow{HOH/H^+}$ glucose + fructose

B. $\xrightarrow{HOH/H^+}$ glucose + glucose

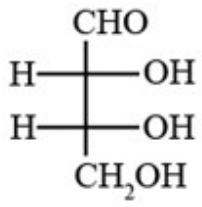
c $\xrightarrow{HOH/H^+}$ glucose + galactose

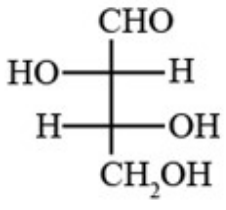
the disaccharides A, B and C respectively are:

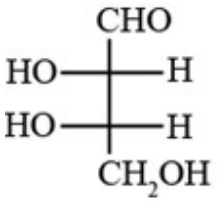
1)Lactose, sucrose, maltose 2)Sucrose, maltose, lactose

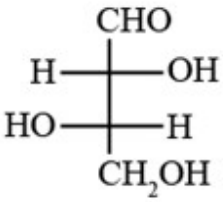
3)Sucrose, lactose, maltose 4)Maltose, sucrose, lactose

14. The correct corresponding order of names of four aldoses with configuration given below,









Respectively, is:

1) L-erythrose, L-threose, L-erythrose, D-threose

2) D-threose, D-erythrose, L-threose, L-erythrose

3) L-erythrose, L-threose, D-erythrose, D-threose

4) D-erythrose, D-threose, L-erythrose, L-threose

15 (A): Maltose is a reducing sugar which gives two moles of D-glucose on hydrolysis.

(R): Maltose has a 1,4-β-glycosidic linkage.

1) If both (A) and (R) are correct and (R) is the correct explanation of (A)

2) If both (A) and (R) are correct but (R) is not the correct explanation of (A)

3) If (A) is correct but (R) is incorrect.

4) If (A) is incorrect but (R) is correct.

16. Which of the following amino acid has thioether in side chain

1) Methionine 2) Cysteine 3) Lysine 4) Proline

17. What is the I.U.P.A.C name of the Thymine

1) 2-oxo-4-amino pyrimidine 2) 2,4-dioxo pyrimidine

3) 5 methyl- 2,4- dioxo pyrimidine 4) 2-methyl -4-Amine pyrimidine

18. Match the following

LIST-I	LIST-II
(A) Glucose and Galactose	(i) c-1 Anomers
(B) D-Idose and D-Talose	(ii) c-2 epimers
(C) Glucose and Mannose	(iii) c-4 epimers
(D) α-Glucose and β-Glucose	(iv) c-3 epimers

1) A-(I) B-(ii) c-(iii) D-(iv)

2) A-(ii) B-(i) c-(iii) D-(iv)

3) A-(iii) B-(iv) c-(ii) D-(i)

4)A-(iv) B-(ii) c-(iii) D-(i)

19. Which of the following hormone modify certain metabolic reaction

1) Testosterone 2) Estradiol 3) Mineralo corticoids 4) Gluco Corticoids

20. Which of the following vitamin is the derivative of pyridine

1) Pyridoxine 2) Pentothenic acid

3) Biotin 4) Ascorbic Acid

21. The number of optical isomers for open chain structure for D- fructose is_____

22. How many of the following are mono Saccharides?

Glucose, Lyxose, Sucrose, Galactose, Lactose, Altrose, Maltose, Mannose, Ribose, Arabinose Starch, Glycogen, Glyceraldehyde

23. How many of the following are non-essential amino Acids?

(a) Valine, Serine, Lysine, Proline, Alanine, Glycine, Tyrosine, Lysine, Aspertic acid

24. In the shorter chain of Insulin Structure the S-S bridge is in between $x^{th} and \ y^{th}$ Cysteine amino acids then x+y=?

25. In Human Body AT/GC ratio is 1.52:1 if the number of moles of thymine in D.N.A 95000 then how many moles of Guanine present?

26. There are 5 Naturally accuring amino acids the maximum number of tetra peptides that can be obtained is _____

27. The number of 'N' atoms in Guanine is_____

28. The number of Hydrogen bonds present in the sequence of a stretch of a double helical D.N.A TGGATTCC is_____

29. In an amino acid, the carboxylic group ionises at $P^{Ka_1} = 4.2$ and ammonium iron at $P^{Ka_2} = 9.2$ the isoelectric point of the amino acid is at p^H of_____

30. Oxidation of glucose is one of the most important reactions in a living cell. What is the number of ATP molecules generated in cells from one molecule of glucose?_____

KEY

1)4	2)1	3)4	4)4	5)3	6)3	7)4	8)4	9)3	10)4
11)1	12)1	13)2	14)4	15)3	16)1	17)3	18)3	19)4	20)2
21)8	22)8	23)6	24)17	25)62500	26)625	27)5	28)20	29)6.7	30)18

HINTS:

1) Proteins are poly peptides
2) Some protein gives yellow colour with HNO_3
3) Carbohydrates
4) Benedict's solution used for sugar test

5) Zinc

6) Glucogen is similar to amylopectin but extensively branched

7) Vitamin – E

8) Arabinose have 5 Carbons

9) Concept

10) Sucrose has α, β - glycosidic linkage

11) Biotin (Vitamin-H)

12) It has 5-carbons, Aldehyde group and Furanose structure

13) Sucrose $\xrightarrow{H_3O^+}$ Glucose + Fructose

Maltose $\xrightarrow{H_3O^+}$ Glucose + Glucose

Lactose $\xrightarrow{H_3O^+}$ Glucose + Galactose

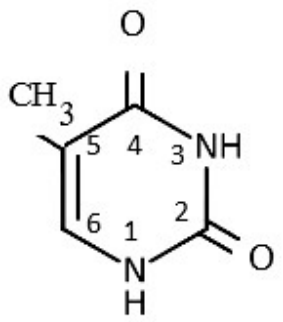
14) Concept

15) Concept

16)

$$H_2N-CH-COOH$$
$$\quad\quad\quad|$$
$$\quad\quad CH_2-CH_2-S-CH_3$$

17)



18) Concept

19) Concept

20) $C_5H_4N-COOH$ $\left(Vita\,\min-B_5\right)$

21) $2^n = 2^3 = 8$

no. of chiral carbons n=3

22) Concept

23) Concept

24) X=6 y=11 $x + y = 6 + 11 = 17$

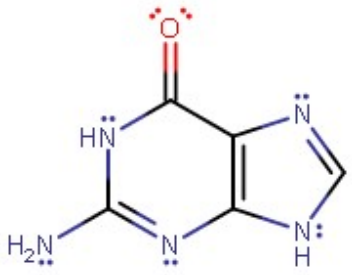
25) $\frac{AT}{GC} = \frac{2 \times 95000}{2 \times G} = \frac{1.52}{1}$

G=62500

26) X=5 Y=4

no. of tetra peptides = $5^4 = 625$

27)



28)

T	G	G	A	T	T	C	C
11	111	111	111	111	111	111	111
A	C	C	T	A	A	G	G

29) $P^H = \frac{P^{Ka_1} + P^{Ka_2}}{2} = \frac{4.2 + 9.2}{2} = \frac{13.2}{2} = 6.6$

30) One Glucose produce 18-A.T.P