CHEMISTRY

BOOKS - MS CHOUHAN

BIOMOLECULES

Level 1

1. Except for glycine, which is achiral , all the amino acids present is proteins

A. are chiral, but racemic

B. have the L configuration at their α carbon

C. have the R configuration at their α carbon

D. have the configuration at their α carbon

Answer: B

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2. Assume that a particular amino acid has an isoelectric point of 6.0. In a solution at pH 1.0, which of the following species will predominate ?

A. $H_3\overset{+}{N}\overset{R}{\overset{|}{C}}HCO_2H$

B. $H_2N\overset{R}{\overset{|}{C}}HCO_2H$

C. $H_3\overset{+}{N}\overset{R}{\overset{|}{C}}HCO_2^-$

D. $H_2N\overset{R}{\overset{|}{C}}HCO_2^-$

Answer: A

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3. The pK_a values for the three ionizable groups X, Y and Z of glutamic acid are 4.3, 9.7 and 2.2 respectively

$$\underset{X}{HO_2C} - CH_2 - \underset{\underset{+NH_3}{|}}{C} H - \underset{Z}{CO_2H}$$

The isoelectric point for the amino acid is :

A. 7

B. 3.25

C. 4.95

D. 5.95

Answer: B

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4. What are vitamins? Which vitamin deficiency causes rickets?

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5. Iso electric point of Alanine is $p^H = 6$. At which p^H, maximum concentration of zwitter ion of alanine will be present ?

A. pH gt 6

B. pH lt 6

C. pH = 6

D. pH = 7

Answer: C

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6. $NH_2 - \underset{\underset{CH_3}{|}}{CH} - \overset{\overset{O}{||}}{C} - NH - CH_2 - CO_2H$

Identify the amino acid obtained by hydrolysis of the above compound:

A. Glycine

B. Alanine

C. Both (a) and (b)

D. None of these

Answer: C

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7. At iso-electric point:

A. conc. of cation is equal to conc of anion

B. Net charge is zero.

C. Maximum conc. of di-polar ion (Zwitter ion) will be present

D. All of the above

Answer: D

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8. Which of following amino acid has lowest iso-electric point ?

A. Glycine

B. Alanine

C. Aspartic acid

D. Lysine

Answer: C

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9. Nitrogen bases present in DNA and RNA are respectively:

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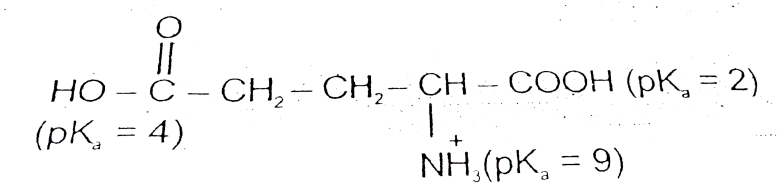
10. The iso-electric point of the given amino acid is,



A. 5.5

B. 6.5

C. 3

D. 5

Answer: C

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11.

$$H-C=C-H \xrightarrow[H_2SO_4]{HgSO_4} (A) \xrightarrow[(2)\,H_3O^{\oplus}]{(1)\,NH_3+HCN} (B)$$

, Product (B) of given reaction is :

A. Glycine

B. Alanine

C. valine

D. Leucine

Answer: B

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12. Which amino acid does not contain chiral centre ?

A. Valine

B. Leucine

C. Glycine

D. Iso-leucine

Answer: C

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13. Which of the following is Sanger reagent ?

A. 2,4-Di-nitro flurobenzene

B. Phenyl isocyanate

C. 2,4-Di-nitro chlorobenzene

D. 2,4-Di-nitro iodobenzene

Answer: A

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14. Which amino acid does not contain chiral centre ?

A. Alanine

B. Leucine

C. Valine

D. Glycine

Answer: D

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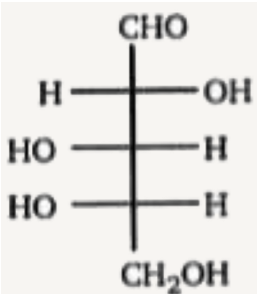
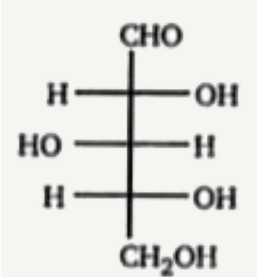
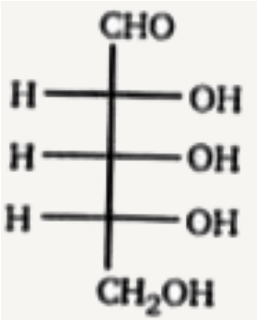
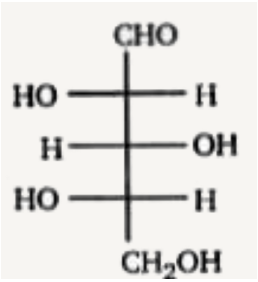
15. Which of the following is an optically active compound ?

A. 

B. 

C. 

D. 

Answer: A

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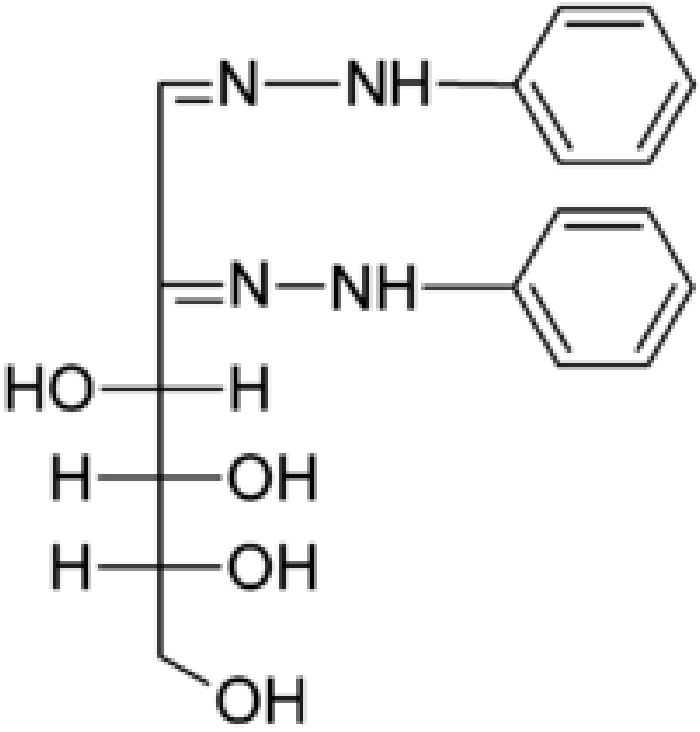
16.  The given osazone can be obtained by :

A. D-glucose

B. D-mannose

C. D-Idose

D. Both (a) & (b)

Answer: D

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17. Which of the following pair gives same phenyl osazone?

A. D-Glucose and D-Allose

B. D-Glucose and D-Alfrose

C. D-Glucose and D-Mannose

D. D-Glucose and D-Talose

Answer: C

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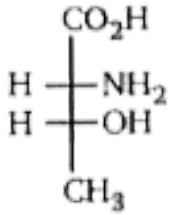
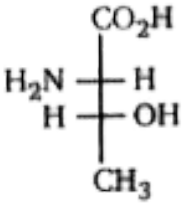
18. Which of the following is the Fischer projection of L-threonine (also known as (2S, 3R)2-amino-3-hydroxybutanoic acid) ?

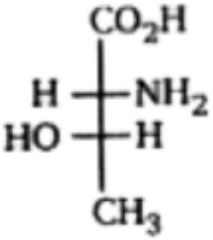
A.



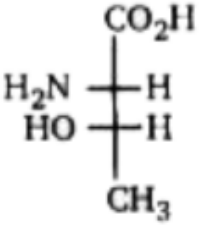
B.



C.



D.



Answer: B

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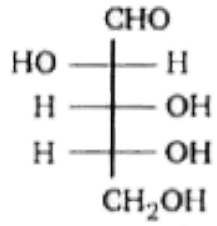
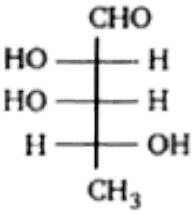
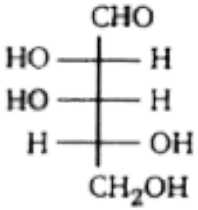
19. Among the three compounds shown below, two yield the same product on reaction with warm HNO_3. The exception is :

A. 

B. 

C. 

D. None of these

Answer: B

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20. The optical rotation of the α form of a pyranose is + 150.70, that of the β form is +52.80. In solution an equlibrium mixture of the anomers has an optical rotation of +80.20. The percentage of the α form at equilibrium is

A. 0.28

B. 0.32

C. 0.68

D. 0.72

Answer: A

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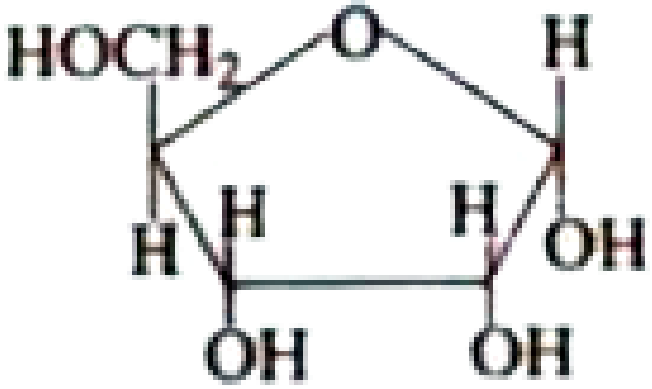
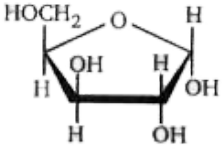
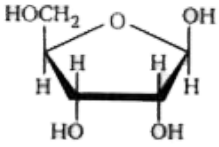
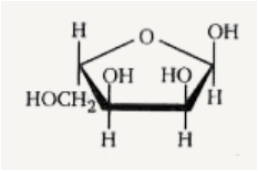
21. Which of the following represents the anomer of compound shown?



A. 

B. 

C. 

D. None of these

Answer: B

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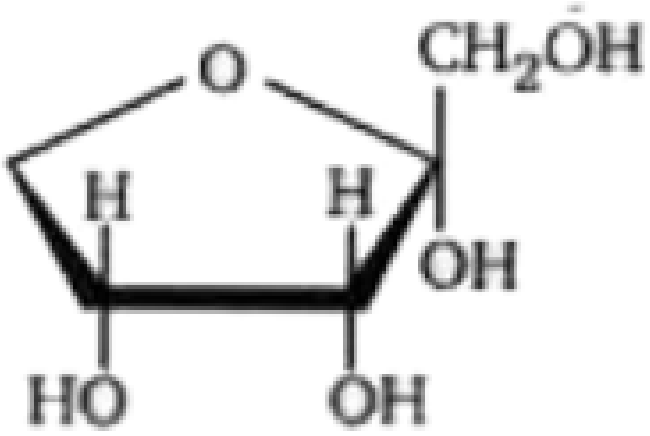
22. Which set of terms correctly identifies the carbohydrate shown?



A. 2,6,8

B. 2,6,7

C. 1,5,8

D. A set of terms other than these

Answer: A

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23. Glucose on treating with excess of phenyl hydrazine gives.

A. two

B. three

C. four

D. five

Answer: B

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24. Which one of the following compounds will form an osazone derivative ?

A. $CH_3CH_2COCH_2OH$

B. $CH_3COCH_2CH_2OH$

C. $CH_3CH_2CHOHCH_2OH$

D. $CH_3CH_2COCH_2OCH_3$

Answer: A

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25. What is the structure of L-arabinose?

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26. Which one of the statements concerning the equilibrium shown is true ?

A. The two structures are enantiomers of each other. They have equal but opposite optical rotations and recemize slowly at room temperature

B. The two structures are enantiomers of each other. They racemize too rapidly at

room temperature for their optical rotations to be measured

C. The two structures are diastereomers of each other. Their interconversion is called mutarotation

D. The two structures are diastereomers of each other. Their interconversion does not require breaking and making bonds, only a change in conformation

Answer: C

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27. One of the similarities between DNA and RNA is that both

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28. Rapid interconversion of α-D-Glucose and β-D-Glucose in solution is known as:

A. racemization

B. asymmetric induction

C. fluxional isomerization

D. mutarotation

Answer: D

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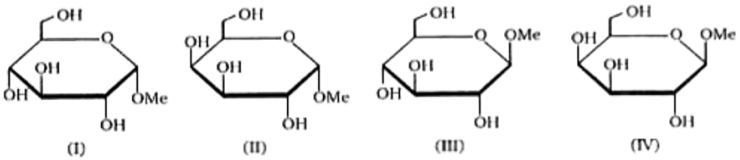
29. Identify the correct set of stereochemical relationships amongst the following

monosaccharides I-IV.



A. I and II are anomers, III and IV are epimers

B. I and III are epimers, II and IV are anomers

C. I and II are epimers, III and IV are anomers

D. I and III are anomers, I and II are epimers

Answer: D

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30. What is the structure of L glucose?

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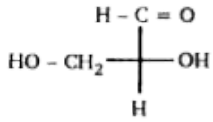
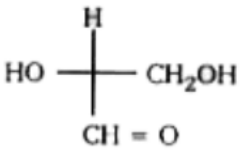
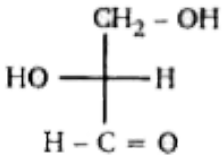
31. What is the structure of L-glyceraldehyde?

A. 

B. 

C. 

D. Both (a) & (b)

Answer: D

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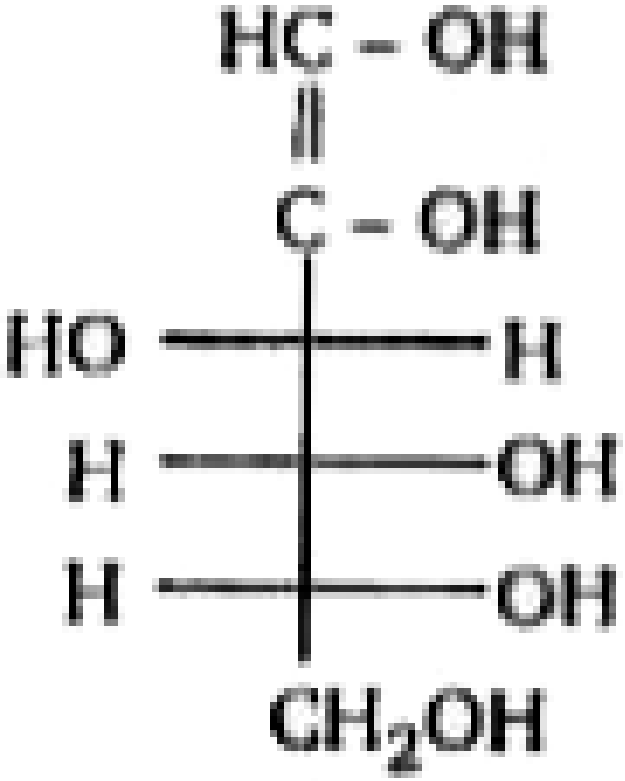
32.  the given is enol form of:

A. D-glucose

B. D-mannose

C. D-fructose

D. All of these

Answer: D

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33. D-glucose $\overset{HO^-}{\Longleftrightarrow} A + B$ A and B are

A. D-mannose & D-mannitol

B. D-mannose & D-Fructose

C. D-Allose & D-Altrose

D. D-Glucose & D-Idose

Answer: B

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34. Stereoisomers of aldoheptose is (a) and stereoisomers of ketoheptose is (b). Ratio of a/b is:

A. $\frac{1}{2}$

B. $\frac{2}{1}$

C. $\frac{4}{1}$

D. $\frac{1}{4}$

Answer: B

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35. D-Glucose $\underset{\Delta}{HNO_3}$ to (A)` , Product (A) is :

A. D-Gluconic acid

B. D-Glucitol

C. D-Fructose

D. D-Glucaric acid

Answer: D

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36. D-glucose & D-Fructose can be differentiated by :

A. Fehling solution

B. Tollens reagent

C. Benedict test

D. Br_2 / H_2O

Answer: D

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37. D-Glucose exist in x different forms. The value of x (stereoisomer) is :

A. 2

B. 3

C. 4

D. 5

Answer: B

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38. D-Mannose $\overset{HO^-}{\Longleftrightarrow}$ D - Glucose $\overset{HO^-}{\Longleftrightarrow}$ (A),

Product (A) of above reaction is

A. D-glucose

B. D-fructose

C. D-talose

D. D-idose

Answer: B

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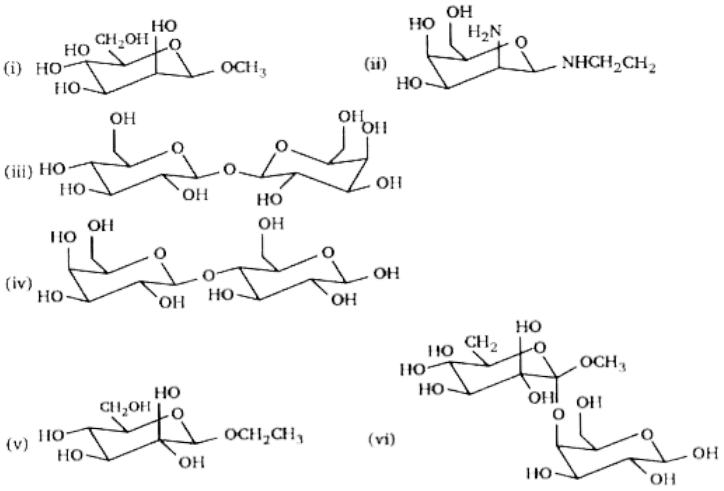
39. Which of the molecules below will reacts with Ag^+ ?



A. (i), (iii) and (v)

B. (ii) and (iv)

C. (iv) and (vi)

D. (i), (ii), (iii) and (vi)

Answer: C

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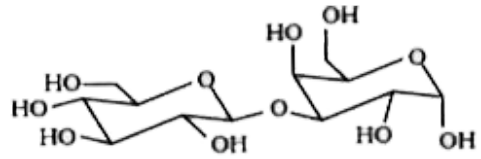
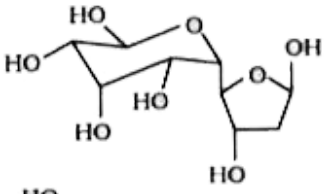
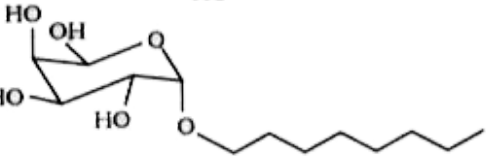
A.



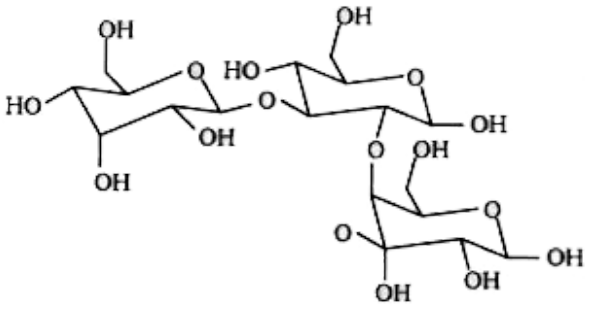
B.



C.



D.



40.

Which of the compounds (A-D) depicted above is NOT a hemiacetal linkage ?

A. Compound A

B. Compound B

C. Compound C

D. None of the above (they are all hemiacetals)

Answer: D

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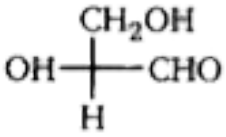
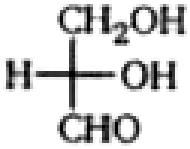
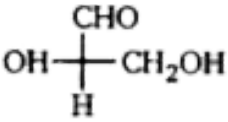
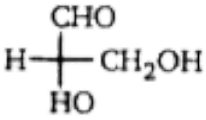
41. Which of the following Fischer projection formula is same as D-Glyceraldehyde ?

A. 

B. 

C. 

D. 

Answer: C

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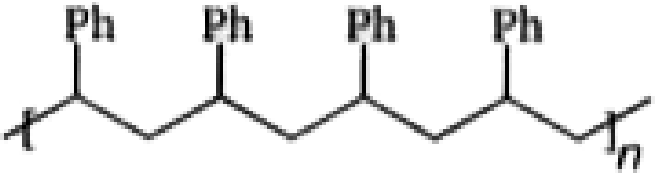
42. What is the structure of the monomer from which the following polymer was made ?



A. 

B. 

C. 

D. 

Answer: B

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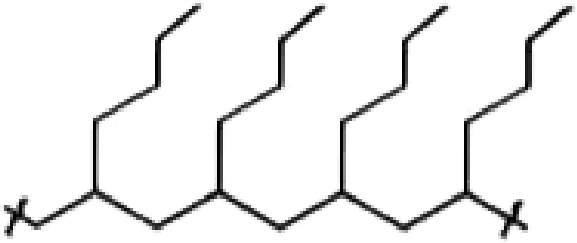
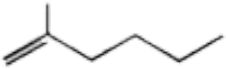
43. The following structure represents a subunit of a hydrocarbon polymer that may be prepared by a radical polymerization method. Identify the monomer that has been polymerized to make this polymer chain.



A. 

B. 

C. 

D. 

Answer: C

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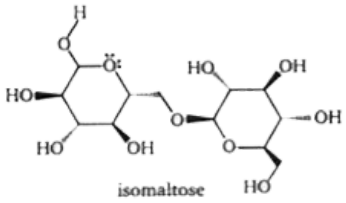
44. Choose the answer that has correctly identified the number of acetals and

hemiacetals in isomaltose.



isomaltose

	Acetal	Hemiacetal		Acetal	Hemiacetal
(a)	0	0	(b)	1	0
(c)	0	1	(d)	1	1

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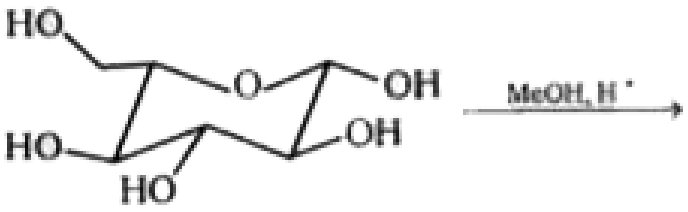
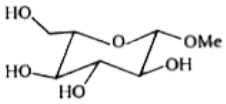
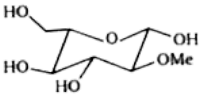
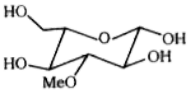
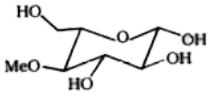
45. Predict the product of the following reaction.



A. 

B. 

C. 

D. 

Answer: A

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46. What are essential amino acid? Name any one essential amino acid.

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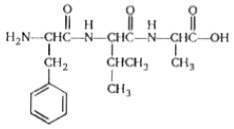
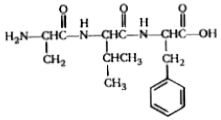
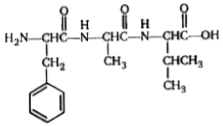
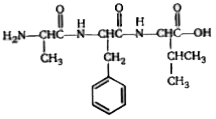
47. Choose the peptide that matches the abbreviation Phe-Val-Ala.

A. 

B. 

C. 

D. 

Answer: A

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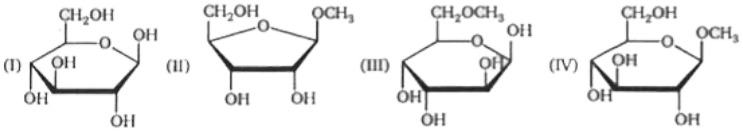
48. Which of the following carbohydrate(s) would not undergo mutarotation in aqueous solution?



A. II only

B. I, III and IV only

C. II and IV only

D. I and III only

Answer: C

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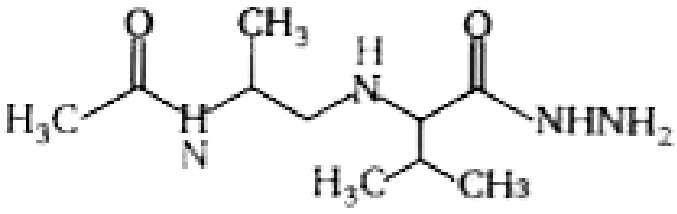
49. The number of peptide bonds in the compound.



A. 1

B. 2

C. 3

D. 4

Answer: A

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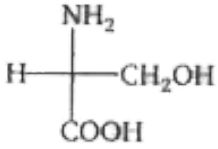
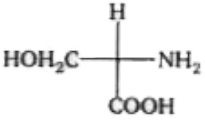
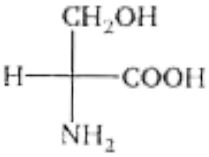
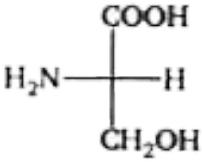
50. Serine $\left(HOCH_2CH(NH_2)_COOH\right)$ is an essential amino acid. The correct Fisher projection of serine is

A. 

B. 

C. 

D. 

Answer: D

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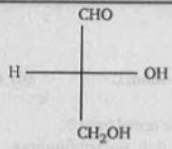
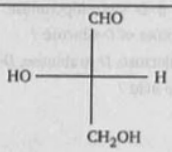
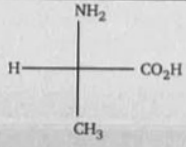
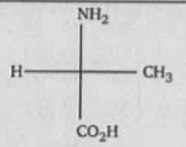
Level 2

1. Match the colume (I) and Column (II). (Matrix)

	Column (I) Molecule		Column (II) Configuration
(a)		(p)	R- (Rectus)
(b)		(q)	S- (Sinister)
(c)		(r)	D
(d)		(s)	L

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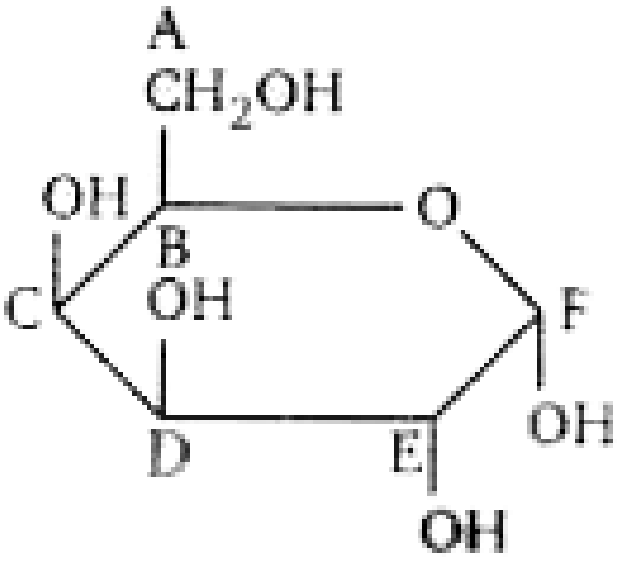

2.

One cyclic acetal form of D - galactose is shown above.

Which atom is the anomeric carbon ?

(a) Atom A (b) Atom B (c) Atom C (d) Atom D

(e) Atom E (f) Atom F

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3. In the presence of lactase, lactose breaks down into molecules of:

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4. Another name for Vitamin D is:

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5. Following diseases are caused by the deficiency of which vitamin:

Poor coagulation of blood