ORGANIC CHEMISTRY

DPP

DAILY PRACTICE PROBLEMS

DPP No. 30

Total Marks : 38

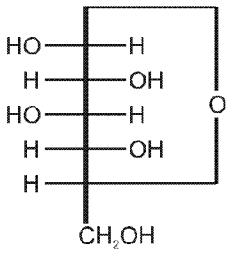
Max. Time : 40 min.

Topic : Biomolecules and Polemers

Type of Questions		**M.M., Min.**
Single choice Objective ('–1' negative marking) Q.1 to Q.10	**(3 marks 3 min.)**	**[30,30]**
Match the Following (no negative marking) Q.11	**(8 marks 10 min.)**	**[8, 10]**

1. Suger (sucrose) is dextrorotatory (+66.5º) but the invert sugar is laevorotatory (–19.9º). It is due to :
(A) Mutarotation
(B) reducing nature of invert sugar
(C) invert sugar is a 1 : 1 mixture of D-glucose (52.7º) and D-Fructose (–92.4º) obtained by hydrolysis of sugar.
(D) Inversion of configuration of sucrose due to hydrolysis.

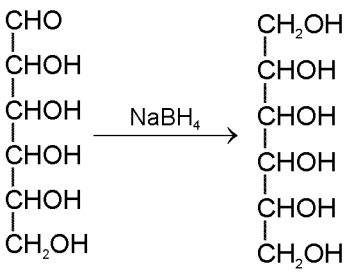
2. **S_1 :** Sucrose has C_1–C_2 glycosidic linkage between β–D–Glucose & α–D–Fructose.
S_2 : Glucose does gives positive test of 2, 4 DNP.
S_3 : Pentacetate of glucose does not forms oxime.

S_4 :  is structure of β D(+) glucose.

(A) F F T T (B) F F T F (C) F F F T (D) T T T T

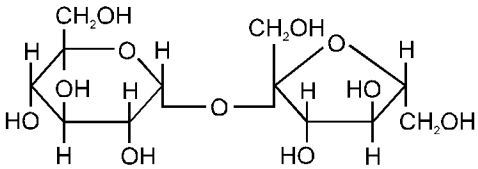
3. Monomer of celluose is
(A) Fructose (B) Maltose (C) Sucrose (D) Glucose

4. Observe the following reaction and find out that how many number of reactant stereoisomers can be reduced to optically inactive meso products.



(A) 2 (B) 4 (C) 6 (D) 8

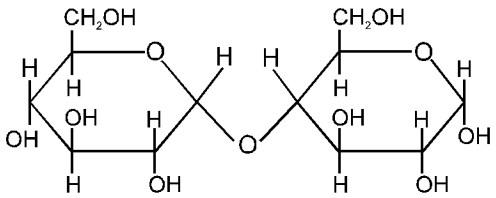
5. The following compound on hydrolysis will give

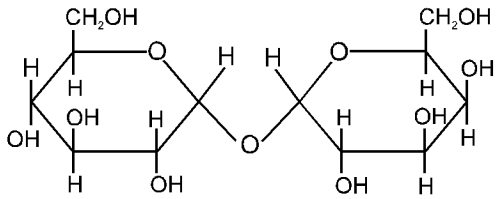


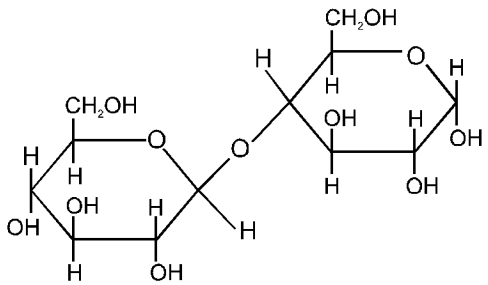
(A) A pair of anomers
(B) A pair of enantiomeris
(C) A pair of epimers
(D) A pair of molecules having common tautomer

6. Which of the following is a nonreducing sugar ?

(A) $OHCH_2 - \underset{\underset{O}{\|}}{C} - (CHOH)_3 - CH_2OH$

(B) 

(C) 

(D) 

7. Find true and False from the following statements regarding carbohydrates

S_1 : Cellulose is a reducing sugar.

S_2 : Sucrose is an oligo sachharide.

S_3 : A pair of diastereomeric aldoses which differ only in configuration at C-2 are anomers.

S_4 : Osazone formation destroys the configuration at C-2 of an aldose, but does not affect the configuration of the rest of the molecule.

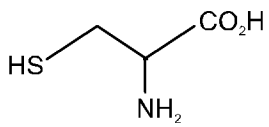
(A) TTTT (B) TFTF (C) FTFT (D) FTTT

8. Which of the following amino acid is most basic :

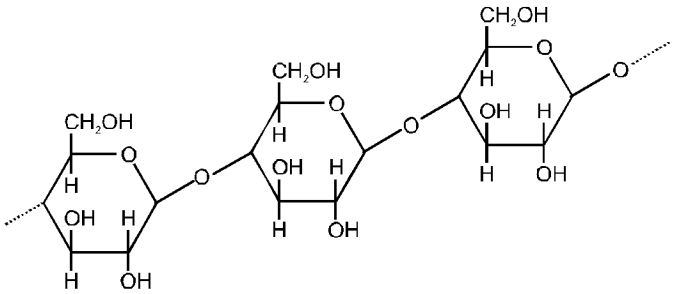
(A) $H_2N-\underset{\underset{NH}{\|}}{C}-NH-CH_2CH_2CH_2-\underset{\underset{NH_2}{|}}{CH}-COOH$

(B) $H_2N-\underset{\underset{CH_3}{|}}{CH}-\overset{\overset{O}{\|}}{C}-NH-CH_2-COOH$

(C) $HOOC-CH_2-\underset{\underset{NH_2}{|}}{CH}-COOH$

(D) 

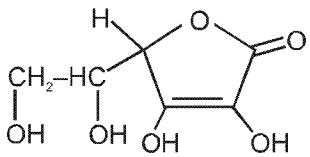
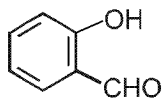
9.* The correct statement(s) about biopolymer **X** is(are) :

X = 

(A) It is a non-reducing sugar.
(B) It exhibits mutarotation.
(C) It has $\beta(C_1 - C_4)$ glycosidic linkage.
(D) Its hydrolysis product is D-Galactose.

10.* The correct statements about peptides are
(A) A dipeptide has one peptide link between two amino acids.
(B) By convention N-Terminus is kept at left and C- terminus at right in the structure of a peptide
(C) If only one amino group and one carboxylic acid, group are available for reaction, then only one dipeptide can forms.
(D) A polypeptide with more than hunderd amino acid recidues (mol. mass > 10,000) is called a protein

11.

Column-I	**Column-II**
(A) D-Glucose	(p) HIO_4 oxidation
(B) D–(+)Glyceraldehyde (Aldotriose)	(q) $NaBH_4$ Reduction
(C)  (Ascorbic acid) vitamin-C	(r) Tollen's test positive
(D) 	(s) Readily water soluble
(E) 1,3-Dihydroxy propanone (Ketotriose)	

Answer Key

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1.	(C)	**2.**	(A)	**3.**	(D)	**4.**	(B)	**5.**	(D)
6.	(C)	**7.**	(C)	**8.**	(A)	**9.***	(AC)		
10.*	(ABCD)	**11.**	(A) - (p, q, r, s) ; (B) - (p, q, r, s) ; (C) - (p, s) ; (D) - (q, r) ; (E) - (p, q, r, s)						

Hints & Solutions

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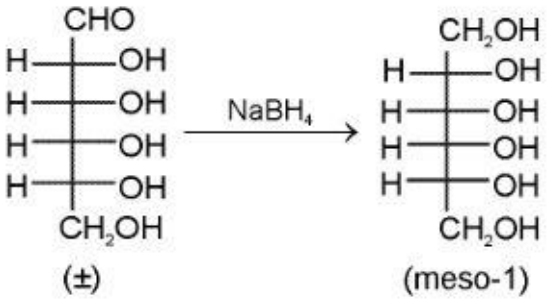
1. Sucrose $\xrightarrow{H_3O^{\oplus}}$ D-Glucose + D-Fructose

$[\alpha] = +66.5$ $[\alpha] = +52.5$ $[\alpha] = -92.4$

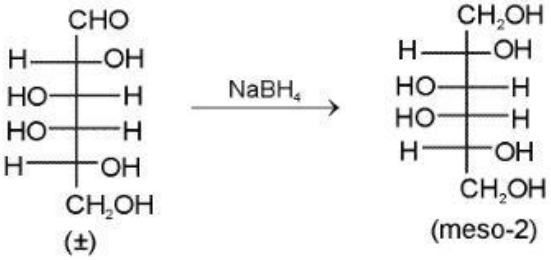
net $[\alpha] = -19.9$

3. Celluose is the polymer of glucose

4.



(±) (meso-1)



(±) (meso-2)

so in total 4 stereoisomers are reduced to meso products.

5. **(D)** The compound is sucrose which on hydrolysis gives equimolecular mixture of glucose and fructose.

6. **(C)** It has cyclic acetal structure.

7. S_2 and S_4 are correct. S_1 and S_3 is incorrect because anomers are those which have difference in configuration at C–1.

8. 'A' contains more basic groups.

9.* It is non-reducing sugar because it lacks hemiactal linkage. Its hydrolysis product is β-D-Glucose.

10.* Dipeptide is formed by 1° amide linkage between 2 amino acid molecules.