



# CHEMISTRY

## BOOKS - XII BOARDS PREVIOUS YEAR

### QUESTION PAPER 2022 TERM 1 SET 2

#### Section A

1. Which one of the following pairs will not form an ideal solution ?

A. Benzene and Toluene

B. n-Hexane and n-Heptane

C. Ethanol and Acetone

D. Bromoethane and Chloroethane

**Answer:**



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2. When NaCl is doped with  $SrCl_2$ , there will be a formation of:

A. Anion vacancies

B. Cation vacancies

C. Both cation and anion vacancies

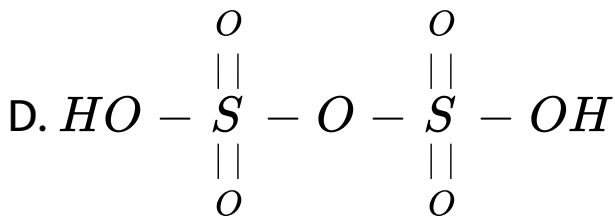
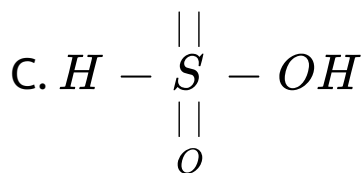
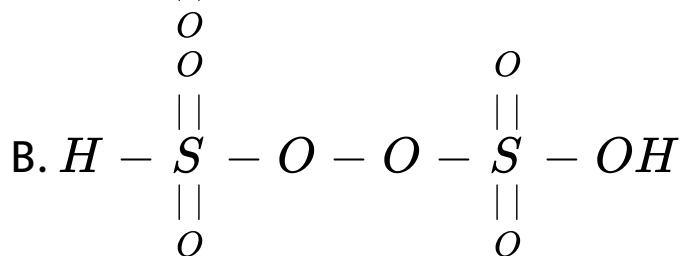
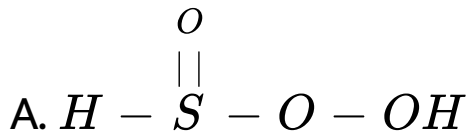
D. F-centre

**Answer:**



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**3. The structure of Oleum is :**



**Answer:**



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4. The  $C - O - O$  bond angle in the ether molecule is

A.  $111^\circ$

B.  $90^\circ$

C.  $120^\circ$

D.  $180^\circ$

**Answer:**



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5. Which of the following reagents will not convert ethyl alcohol into ethyl chloride ?

A.  $PCl_5$

B.  $NaCl$

C.  $SOCl_2$

D.  $HCl / ZnCl_2$

**Answer:**



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6. Nucleotide is composed of

- A. pentose sugar and phosphoric acid
- B. nitrogenous base and phosphoric acid
- C. nitrogenous base and a pentose sugar
- D. nitrogenous base, a pentose sugar and phosphoric acid

**Answer:**



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7. The oxidation state of -3 is least stable in

A. N

B. Bi

C. As

D. P

**Answer:**



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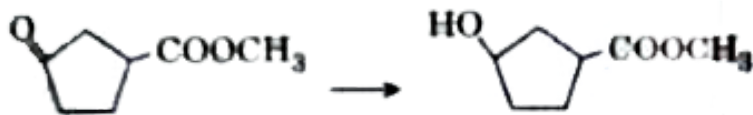
8. Amorphous solids may be considered as:



- A. supercooled solids
- B. supercooled liquids
- C. superheated liquids
- D. superheated solids

**Answer:**

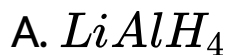
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9.

Which of the following reagents should be

used to carry out the above conversion ?



**Answer:**



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**10.** An azeotropic solution of two liquids has a boiling point higher than either of the two when it

A. shows a negative deviation from Raoult's law

B. shows a positive deviation from Raoult's law

C. is saturated

D. shows no deviation from Raoult's law

**Answer:**



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**11.** Which of the following crystals will show metal deficiency defect?

A. NaCl

B. ZnO

C. FeO

D. AgCl

**Answer:**



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**12.** Phenol on being heated with concentrated  $H_2SO_4$  and then with concentrated  $HNO_3$  gives

- A. o-nitrophenol
- B. 2,4,6-trinitrophenol
- C. p-nitrophenol
- D. m-nitrophenol

**Answer:**



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**13.**  $O_3$  reacts with KI solution to produce :

A.  $O_2$  only

B.  $I_2$  only

C.  $KIO_3$

D. Both  $O_2$  and  $I_2$

**Answer:**



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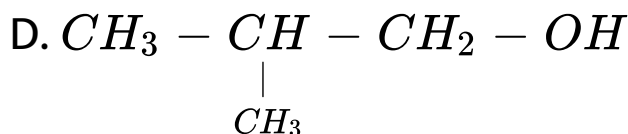
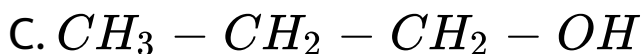
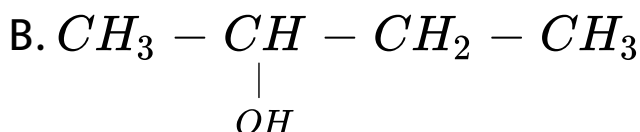
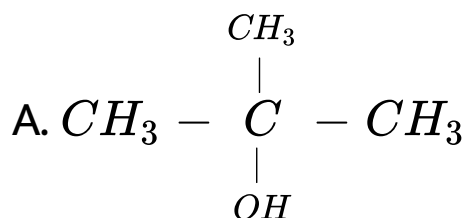
14.  $\alpha - D$ - Glucose and  $\beta - D$ -Glucose differ from each other with respect to the :

- A. Number of - OH groups
- B. Configuration at the C-1 carbon
- C. Size of the hemiacetal ring
- D. Configuration at the C-5 carbon

**Answer:**



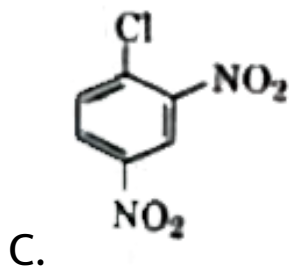
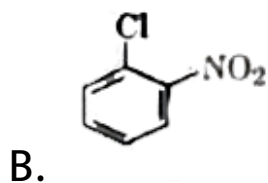
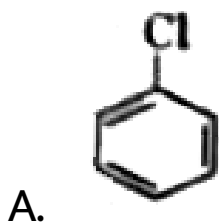
15. Lucas reagent produces cloudiness immediately with:

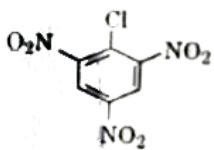


**Answer:**



16. Which of the following is most reactive towards nucleophilic substitution reaction ?





D.

**Answer:**



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17. Pressure does not have any significant effect on solubility of solids in liquids because

:

A. Solids are highly compressible

B. Liquids are highly compressible

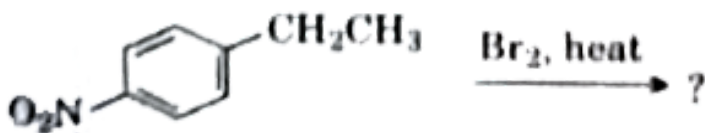
C. Solubility of solid in liquid is directly proportional to partial pressure

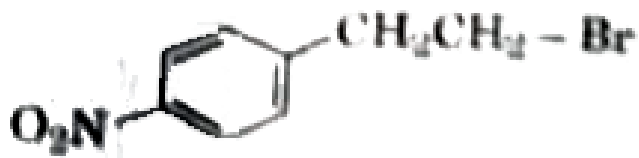
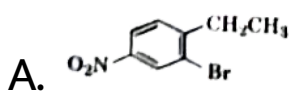
D. Solids and liquids are highly incompressible

**Answer:**

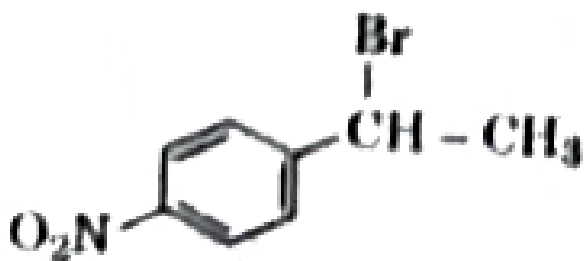
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18. Main product in the following reaction is :





B.



C.



D.

Answer:





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19. Which of the following forms strong  $p\pi - p\pi$  bonding ?

A.  $P_4$

B.  $N_2$

C.  $Sb_4$

D.  $As_4$

**Answer:**



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20. Which of the following halogens can replace all other halogens from their halide compounds ?



**Answer:**



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21. The functional unit that is repeated in a protein molecule is :

- A. An ester linkage
- B. A glycosidic linkage
- C. A peptide linkage
- D. An ether linkage

**Answer:**



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22. The lowest boiling point of 'He' is due to :

A. Its inertness

B. Its high polarizability

C. Its small size

D. Weak dispersion forces between its  
atoms

**Answer:**



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23. Major products formed by heating

$(CH_3)_3C - O - CH_2 - CH_3$  with HI are :

A.  $(CH_3)_3C - I$  and  $CH_3CH_2OH$

B.  $(CH_3)_3C - OH$  and  $CH_3CH_2I$

C.  $(CH_3)_3C - I$  and  $CH_3CH_2I$

D.  $(CH_3)_3C - OH$  and  $CH_3CH_2OH$

**Answer:**



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24. The osmotic pressure of a solution increases if :

- A. The volume of the solution is increased
- B. The number of solute molecules is increased
- C. Temperature is decreased
- D. Solution constant (R) is increased

**Answer:**



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25. Chlorine reacts with hot and concentrated  $NaOH$  to give

A.  $NaCl$  and  $NaClO$

B.  $NaClO$  and  $NaClO_2$

C.  $NaCl$  and  $NaClO_4$

D.  $NaCl$  and  $NaClO_3$

**Answer:**



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## Section B

1. The vapour pressure of a dilute aqueous solution of glucose is 750mmHg at 373K. The mole fraction of the solute is

A.  $\frac{1}{7.6}$

B.  $\frac{1}{38}$

C.  $\frac{1}{76}$

D.  $\frac{1}{10}$

**Answer:**



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2. The bases that are common in both DNA and RNA are :

- A. Adenine, Guanine and Cytosine
- B. Adenine, Guanine and Thymine
- C. Adenine, Uracil and Cytosine
- D. Guanine, Uracil and Thymine

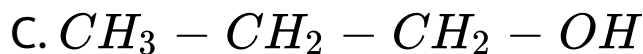
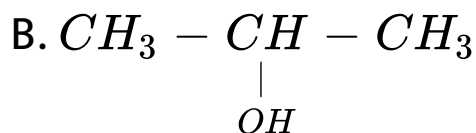
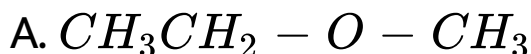
**Answer:**



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3. A compound ( $X$ ) with the molecular formula  $C_3H_8O$  can be oxidized to another ( $Y$ ) whose molecular formula is  $C_6H_6O_2$

The compound ( $X$ ) may be

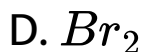
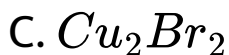


**Answer:**



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4. Which reagent is required for one step conversion of benzene diazonium chloride to bromobenzene?



**Answer:**



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5. Number of lone pairs of electrons on Xe atoms in  $XeF_2$ ,  $XeF_4$ ,  $XeF_6$  and  $XeO_4$  molecules are respectively

A. 4, 3 and 2

B. 2, 3 and 1

C. 3, 2 and 0

D. 3, 2 and 1



**Answer:**



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**6. Form of sulphur which shows paramagnetic behaviour**

A.  $S_8$

B.  $S_4$

C.  $S_2$

D.  $S_6$

**Answer:**



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7. An element with density  $3 \text{ g cm}^{-3}$  forms a bcc lattice with edge length of  $3 \times 10^{-8} \text{ cm}$ .

The molar mass of the element is :

$$\left( N_A = 6 \times 10^{23} \text{ mol}^{-1} \right)$$

A.  $48.6 \text{ g mol}^{-1}$

B.  $24.3 \text{ g mol}^{-1}$

C.  $60 \text{ g mol}^{-1}$

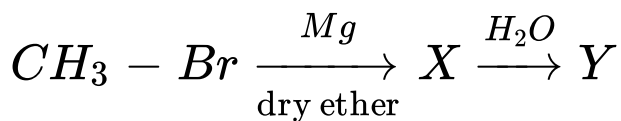
D.  $56\text{g mol}^{-1}$

**Answer:**



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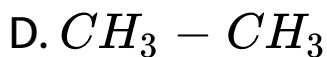
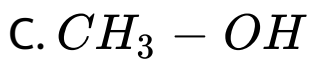
**8.** In the following reaction :



'Y' will be :

A.  $\text{CH}_4$

B.  $\text{CH}_3\text{MgBr}$



**Answer:**



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9. Which of the following has greatest reducing power?

A. HI

B. HBr

C. HCl

D. HF

**Answer:**



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**10.** The freezing point of a 0.2 molal solution of a non-electrolyte in water is :

( $K_f$  for water =  $1.86 \text{ K kg mol}^{-1}$  )

A.  $-0.372^\circ \text{C}$

B.  $-1.86^{\circ}C$

C.  $+0.372^{\circ}C$

D.  $+1.86^{\circ}C$

**Answer:**



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**11.** Calculate the packing efficiency for bcc lattice.

A. 58 %

B. 68 %

C. 32 %

D. 74 %

**Answer:**



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12.  $NO_2$  gas dimerises because :

A. It is acidic in nature

B. It contain even number of valence electrons

C. It contains odd number of valence electrons

D. It is inert at room temperature

**Answer:**



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13. A compound forms hcp structure. The number of tetrahedral voids in 0.5 mol of it is :

A.  $6.022 \times 10^{23}$

B.  $9.033 \times 10^{23}$

C.  $3.011 \times 10^{23}$

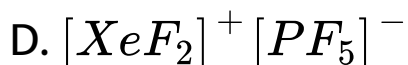
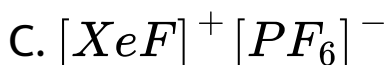
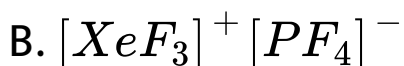
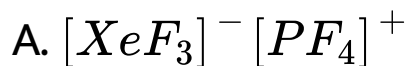
D.  $5 \times 10^{23}$

**Answer:**



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14.  $XeF_2$  on reaction with  $PF_5$  forms :

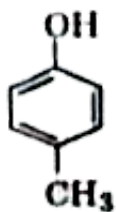


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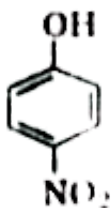


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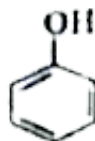
15. Arrange the following compounds in decreasing order of their acidic character :



(I)



(II)



(III)

A.  $II > I > III$

B.  $II > III > I$

C.  $III > I > II$

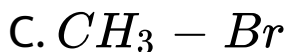
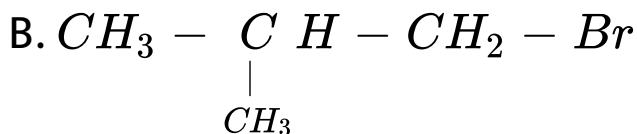
D.  $I > II > III$

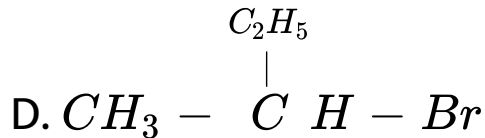
**Answer:**



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**16.** Which of the following compound undergoes racemisation on hydrolysis with aqueous KOH ?





**Answer:**



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**17.** Which of the following is not true ?

A. Fluorine exhibits only-1 oxidation state

B. Among halide ions,  $I_2$  is the strongest  
oxidising agent

C. F-F bond has lower bond dissociation enthalpy than Cl-Cl bond.

D. Fluorine forms only one oxoacid.

**Answer:**



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**18.** The IUPAC name of isobutyl bromide is :

A. 1-bromo-3-methylbutane

B. 3-bromo-2-methylpropane

C. 2-bromo-2-methylpropane

D. 1-bromo-2-methylpropane

**Answer:**



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**19.** Chlorobenzene when treated with sodium in dry ether gives Diphenyl . It is called :

A. Wurtz reaction

B. Fitting reaction

C. Wurtz-Fitting reaction

D. Friedel-Crafts reaction

**Answer:**



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**20. Assertion (A) :**  $NH_3$  is less basic than  $PH_3$

**Reason (R) :** Nitrogen is more electronegative than phosphorus .



A. Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).

B. Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of Assertion (A)

C. Assertion (A) is true, but Reason (R) is false

D. Assertion (A) is false, but Reason (R) is true.

**Answer:**



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**21. Assertion:** Osmotic pressure is a colligative property.

**Reason:** Osmotic pressure of a solution at any temperature  $T$  depends on the molar concentration.

A. Both Assertion (A) and Reason (R) are true and Reason (R) is the correct

explanation of Assertion (A).

B. Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of Assertion (A)

C. Assertion (A) is true, but Reason (R) is false

D. Assertion (A) is false, but Reason (R) is true.

**Answer:**



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**22. Assertion (A) :** Aryl halides are extremely less reactive towards nucleophilic substitution reaction.

**Reason (R) :** Halogen atom shows + I effect in Aryl halides.

A. Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).

B. Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of Assertion (A)

C. Assertion (A) is true, but Reason (R) is false

D. Assertion (A) is false, but Reason (R) is true.

**Answer:**



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**23. Assertion (A) :** Due to Frenkel defect there is no effect on density of solid .

Reason : Ions shift from its normal site to an interstitial site in Frenkel defect.

A. Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).

B. Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of Assertion (A)

C. Assertion (A) is true, but Reason (R) is false

D. Assertion (A) is false, but Reason (R) is true.

**Answer:**



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**24.** Assertion (A) : Ozone is a powerful oxidising agent in comparison to  $O_2$ .

Reason (R) : Ozone is thermodynamically stable with respect to oxygen.

A. Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).

B. Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of Assertion (A)

C. Assertion (A) is true, but Reason (R) is false



D. Assertion (A) is false, but Reason (R) is true.

**Answer:**



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**Section C**

# 1. Match the following :

<i>I</i>	<i>II</i>
i. Salicyl aldehyde	A. Kolbe's reaction
ii. <i>o</i> -nitrophenol	B. Williamson's synthesis
iii. Salicylic acid	C. Intramolecular Hydrogen bonding
iv. <i>p</i> -nitrophenol	D. Reimer-Tiemann reaction
v. Unsymmetrical ethers	

Which of the following is the best matched option?

A. *i* – A, *ii* – C, *iii* – D, *iv* – B

B. *i* – D, *v* – B, *iii* – C, *iv* – A

C. *i* – D, *v* – B, *ii* – C, *iii* – A

D. *i* – B, *ii* – C, *iii* – A, *iv* – D

**Answer:**



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2. Which of the following analogies is correct :

A. Oxygen :  $d\pi - p\pi$  :: Sulphur :  $p\pi - p\pi$

B.  $NH_3$  : Hydrogen bonding ::  $PH_3$  : No  
Hydrogen bonding

C.  $Cl_2$ : More reactive ::  $ClF$  : Less reactive

D. Xe :No compounds :: He : Many  
compounds

**Answer:**



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**3. Complete the following analogy:**

A. ZnS : A :: SiC:B  
A: Molecular solid :: B:Ionic solid

B. ZnS : A :: SiC:B  
A: Ionic solid :: B:Metallic solid

C. ZnS : A :: SiC:B  
A: Metallic solid :: B:Covalent solid

D.  $\text{ZnS} : \text{A} :: \text{SiC} : \text{B}$   
A: Ionic solid :: B: Covalent solid

**Answer:**



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4. Carbohydrates are polyhydroxy aldehydes or ketones and are also called saccharides. Glucose is an example of monosaccharides. Glucose ( $\text{C}_6\text{H}_{12}\text{O}_6$ ) is an aldohexose and its open chain structure was assigned on the basis of many reactions as evidences like

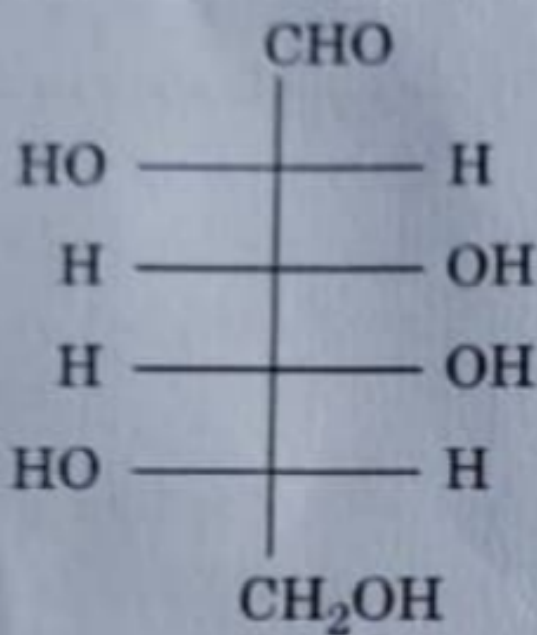
presence of carbonyl group, presence of straight chain, presence of five-OH groups, etc.

Glucose is correctly named as D(+)*Glucose*.

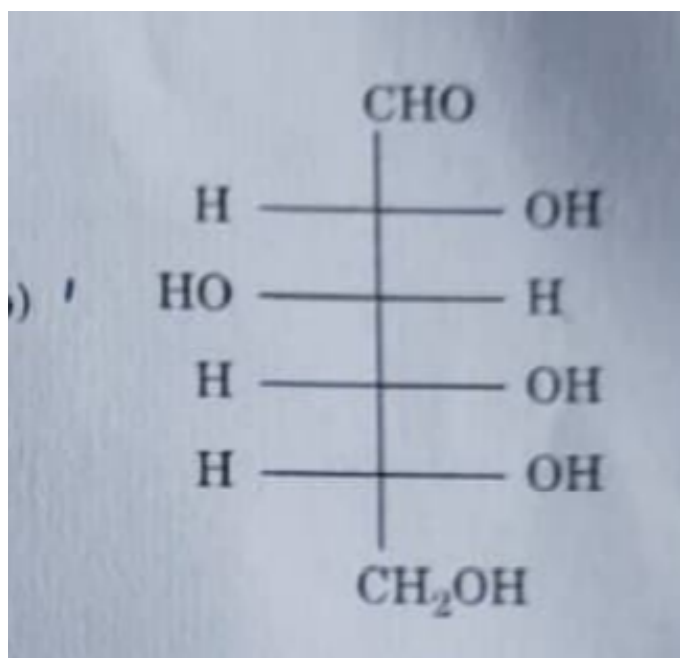
Glucose is found to exist in two different crystalline forms which are named as  $\alpha$  and  $\beta$ .

Despite having the aldehyde group, glucose does not give 2,4-DNP test.

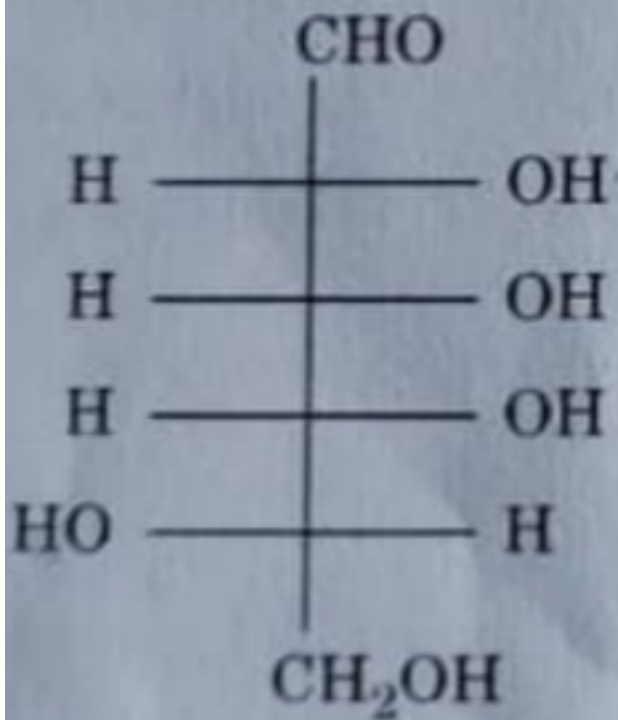
Which of the following represents D(+)*Glucose*?



A.

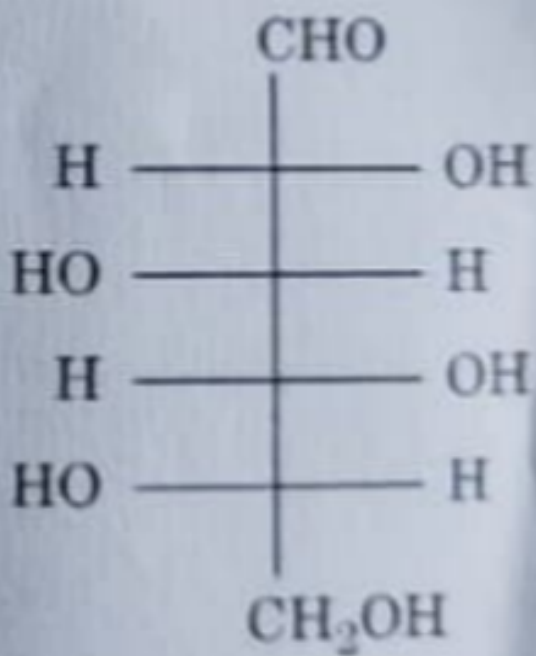


B.



c.





D.

**Answer:**



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5. Carbohydrates are polyhydroxy aldehydes or ketones and are also called saccharides. Glucose is an example of monosaccharides. Glucose ( $C_6H_{12}O_6$ ) is an aldohexose and its open chain structure was assigned on the basis of many reactions as evidences like presence of carbonyl group, presence of straight chain, presence of five-OH groups, etc. Glucose is correctly named as D(+)-Glucose. Glucose is found to exist in two different crystalline forms which are named as  $\alpha$  and  $\beta$ . Despite having the aldehyde group, glucose

does not give 2,4-DNP test.

Glucose on oxidation with  $HNO_3$  gives a dicarboxylic acid called saccharic acid. This result validates the fact that Glucose possesses :

A. –  $CHO$  group

B. –  $OH$  group

C. a straight chain

D. both –  $CHO$  and –  $CH_2OH$  groups

at the terminals of the chain

**Answer:**



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**6.** Carbohydrates are polyhydroxy aldehydes or ketones and are also called saccharides. Glucose is an example of monosaccharides. Glucose ( $C_6H_{12}O_6$ ) is an aldohexose and its open chain structure was assigned on the basis of many reactions as evidences like presence of carbonyl group, presence of straight chain, presence of five-OH groups, etc.

Glucose is correctly named as D(+)*Glucose*.

Glucose is found to exist in two different crystalline forms which are named as  $\alpha$  and  $\beta$ .

Despite having the aldehyde group, glucose does not give 2,4-DNP test.

The pentaacetate of glucose does not react with  $H_2N - OH$  indicating the absence of

A.  $-OH$  group

B.  $-CHO$  group

C.  $-COOH$  group

D.  $-CH_2OH$  group

**Answer:**



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