



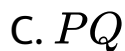
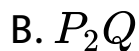
# CHEMISTRY

## BOOKS - XII BOARDS PREVIOUS YEAR

### QUESTION PAPER 2022 TERM 1 SET 1

#### Section A

1. In a crystal of an ionic compound, the ions Q form the ccp lattice and the ions P occupy all the tetrahedral voids. The formula of the compound is



**Answer:**



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2. Increasing the temperature of an aqueous solution will cause

A. Increase in Molarity

B. Increase in Molality

C. Decrease in Molarity

D. Decrease in Molality

**Answer:**



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**3.** Which of the following conditions is correct for an ideal solution?

A.  $\Delta H_{\text{mix}} = 0$  and  $\Delta V_{\text{mix}} = 0$

B.  $\Delta H_{\text{mix}} > 0$  and  $\Delta V_{\text{mix}} > 0$

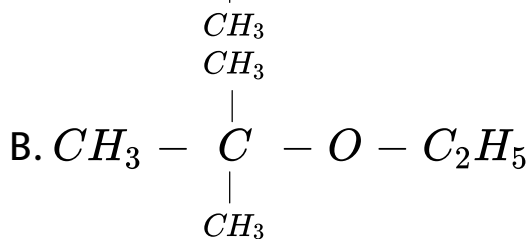
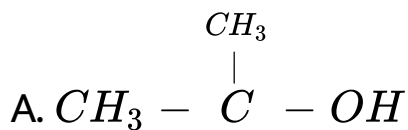
C.  $\Delta H_{\text{mix}} < 0$  and  $\Delta V_{\text{mix}} < 0$

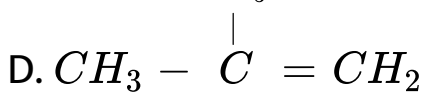
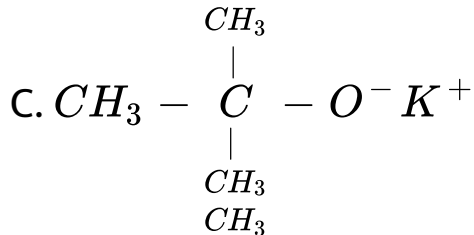
D.  $\Delta H_{\text{mix}} > 0$  and  $\Delta V_{\text{mix}} < 0$

**Answer:**

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4. 2-Bromo-2-methylpropane is allowed to react with alcoholic KOH solution. The major product formed is



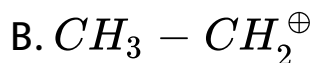
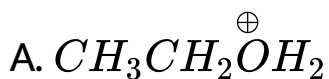
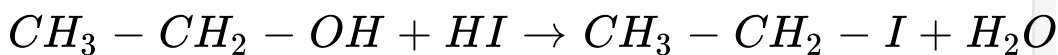


**Answer:**



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5. Which of the following intermediates is formed in the reaction shown below?



C. Both  $CH_3CH_2\overset{\oplus}{O}H_2$  and  $CH_3 - CH_2^{\oplus}$

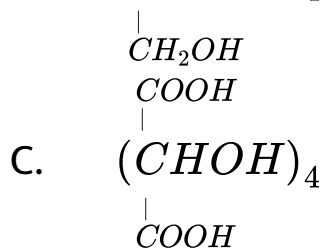
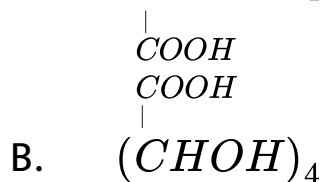
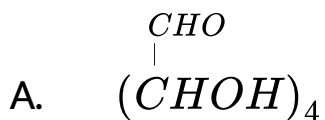
D.  $CH_3CH_2 - \overset{\oplus}{O} - CH_2 - CH_3$

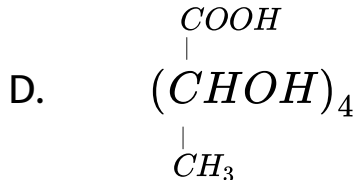
**Answer:**



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6. Glucose is oxidized by  $Br_2$  water to give





**Answer:**



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7. Which of the following has the largest bond angle?



**Answer:**



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8. Which of the following elements does not show an oxidation state higher than +2 ?

A. Oxygen

B. Sulphur

C. Selenium

D. Tellurium

**Answer:**





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9. Which of the following is a molecular solid?

A. KCl

B.  $SiO_2$

C. Cu

D. Ar

**Answer:**

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10. For determination of molar mass of polymers and proteins, which colligative property is used?

A. Relative lowering in vapour pressure

B. Elevation in boiling point

C. Osmotic pressure

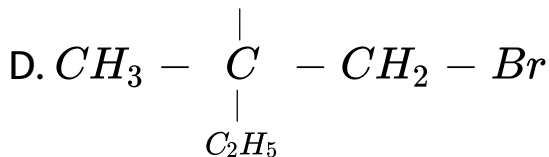
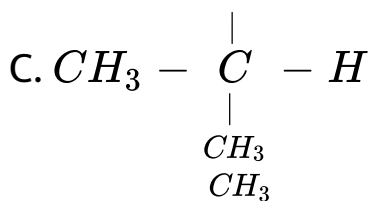
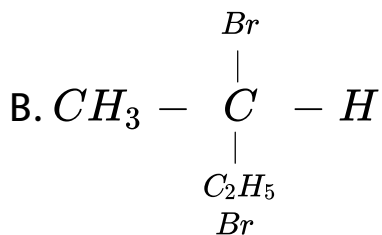
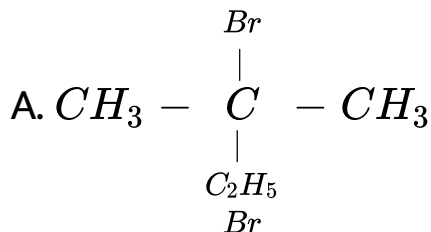
D. Depression in freezing point

**Answer:**



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11. Which of the following molecules is chiral in nature?

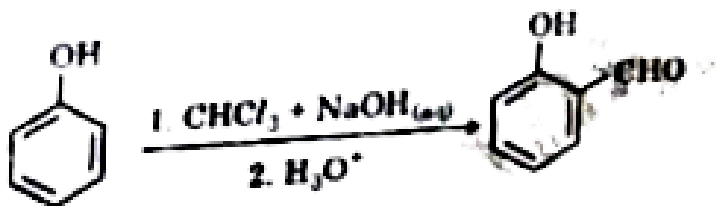


**Answer:**



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12. The reaction:



is an example of

- A. Reimer-Tiemann reaction
- B. Kolbe's reaction
- C. Williamson's synthesis
- D. Wurtz reaction

**Answer:**



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13. Which of the following is fibrous protein?

A. Albumin

B. Keratin

C. Insulin

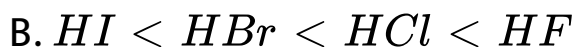
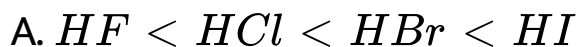
D. Globin

**Answer:**



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14. The acid strength of HF, HCl, HBr and HI increase in the order



**Answer:**



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15. Which is not correct about concentrated  $H_2SO_4$  ?

A. Dehydrating agent

B. Oxidising agent

C.  $Ka_2 > Ka_1$

D. It forms two series of salts

**Answer:**



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**16.** Pure water boils at  $373.15K$  and nitric acid boils at  $359.15K$ . An azeotropic mixture of  $H_2O$  and  $HNO_3$  boils at  $393.15K$ . Distilling the azeotropic mixture will cause

A. Pure nitric acid to distil over first

B. Pure water to distil over first

C. One of them to distil over with a small amount of the other .

D. both of them to distil over in the same composition as that of the mixture being distilled .



**Answer:**



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**17.** A 5% (by mass) solution of glucose (molar mass =  $180\text{g mol}^{-1}$ ) is isotonic with 1% solution (by mass) of a substance 'X'. The molar mass of 'X' is

A.  $36\text{g mol}^{-1}$

B.  $18\text{g mol}^{-1}$

C.  $72\text{g mol}^{-1}$

D.  $900\text{g mol}^{-1}$

**Answer:**



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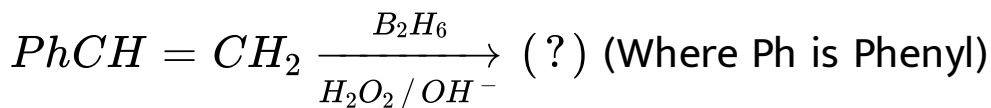
**18.** An  $S_N1$  reaction of an enantiomerically pure chiral alkyl halide gives a product .

- A. with retention of configuration
- B. with inversion of configuration
- C. with racemisation
- D. with partial racemisation

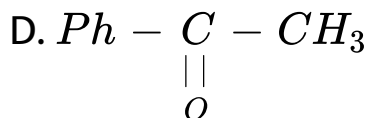
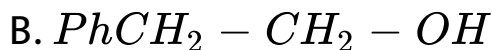
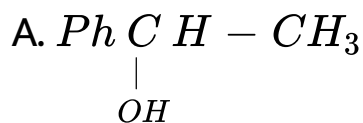
**Answer:**



19. In the following reaction



The product formed is



Answer:

20.  $\alpha$ -D-Glucopyranose and  $\beta$  - *D*-Glucopyranose are

- A. Isomers which differ in configuration at C-5
- B. Geometrical isomers
- C. Functional isomers
- D. Anomers

**Answer:**



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21. Fluorine does not exhibit variable oxidation states due to

- A. Non-availability of d-orbitals in valence shell
- B. Low bond dissociation enthalpy
- C. High electronegativity
- D. Small size

**Answer:**



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22. The formation of  $O_2^+ [PtF_6]^-$  is the basis for the formation of xenon fluorides. This is because:

- A.  $O_2$  and Xe have comparable electronegativities.
- B.  $O_2$  and Xe have comparable sizes.
- C.  $O_2$  and Xe have comparable ionization enthalpies.
- D.  $O_2$  and Xe have comparable electron gain enthalpies.

**Answer:**



23. Chlorobenzene reacts with  $Cl_2$  in the presence of  $FeCl_3$  giving ortho and para chloro compounds.

The reaction is

- A. Nucleophilic substitution reaction
- B. Nucleophilic addition reaction
- C. Electrophilic addition reaction
- D. Electrophilic substitution reaction

**Answer:**

24. Phenol is more acidic than ethanol because

A. Ethoxide ion is more stable than Phenoxide ion.

B. Phenoxide ion is more stable than Ethoxide ion.

C. Phenol undergoes electrophilic substitution reaction.

D. Phenol undergoes protonation easily.

**Answer:**



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25. Which of the following statements is not correct about amorphous solids?

- A. Amorphous solids are anisotropic
- B. Amorphous solids have a tendency to flow.
- C. Amorphous solids have short range order.
- D. Amorphous solids have irregular shape.

**Answer:**



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## Section B

1. An element with molar mass  $96\text{g mol}^{-1}$  forms a cubic unit cell with edge length  $4 \times 10^{-8}$  cm. If density is  $10\text{g cm}^{-3}$ , the nature of unit cell is ( $N_A = 6 \times 10^{23}\text{mol}^{-1}$ )

- A. simple cubic
- B. bcc
- C. fcc
- D. End centered cubic

**Answer:**



2. When 2.5 g of a non-volatile solute was dissolved in 50 mL of water, it gave boiling point elevation of  $0.52^{\circ}C$ . The molar mass of the solute is ( $K_b$  for water =  $0.52K m^{-1}$ )

A.  $100gmol^{-1}$

B.  $50gmol^{-1}$

C.  $25gmol^{-1}$

D.  $75gmol^{-1}$

**Answer:**





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3. Which of the following gas is released on heating ammonium dichromate  $(NH_4)_2Cr_2O_7$  ?

A.  $NO_2$

B.  $N_2O$

C.  $NO$

D.  $N_2$

**Answer:**



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4. On its reaction with water and alkalis, the behaviour of  $SO_{2(g)}$  is very similar to that of which gas?

A.  $NO_2$

B.  $CO_2$

C.  $NH_3$

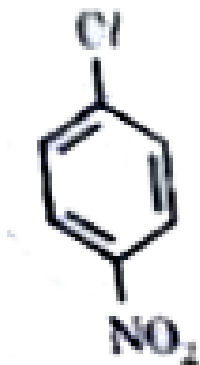
D.  $N_2O$

**Answer:**

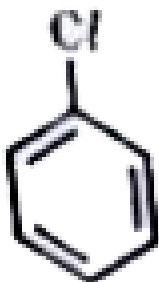


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5. Which of the following is most reactive towards nucleophilic substitution reaction ?



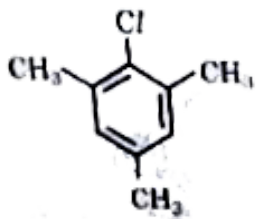
A.



B.



C.



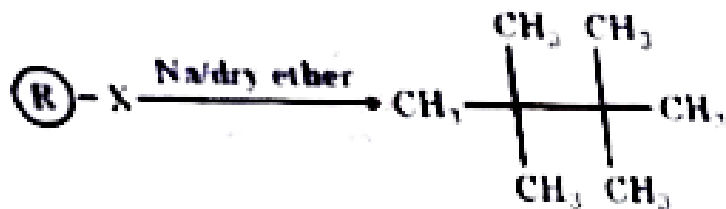
D.

**Answer:**



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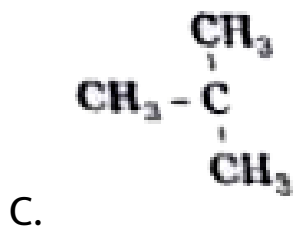
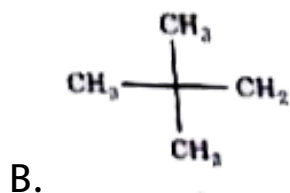
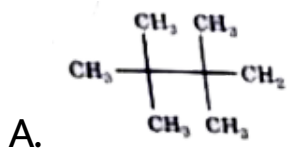
6. In the following reaction



$\textcircled{\text{R}}$  in the above reaction is

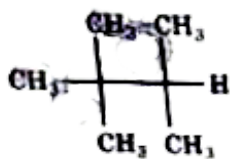
in the

above reaction is .





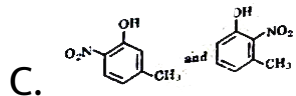
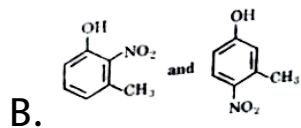
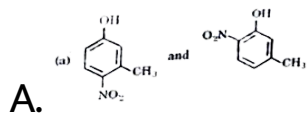
D.

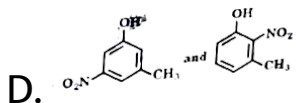


Answer:

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7. The structure(s) of the major product(s) expected from the mononitration of 3-methylphenol will be .

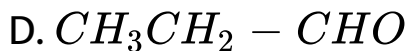
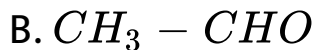
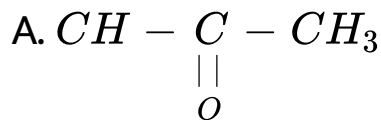




**Answer:**

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8. 1-Phenylethanol may be prepared by the reaction of  $C_6H_5MgBr$  with



**Answer:**



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9. Two among the three compounds of DNA are 2-deoxyribose and a nitrogen containing heterocyclic base. The third component is

A. D-ribose

B. Thymine

C. Guanine

D. Phosphoric acid

**Answer:**



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**10.** Which one among the following bases is usually not present in RNA?

A. Uracil

B. Thymine

C. Adenine

D. Guanine

**Answer:**



11. Glucose on reaction with  $(CH_3CO)_2O$  forms glucose pentaacetate which confirms the presence of

- A.  $-CHO$  group
- B.  $-COOH$  group
- C. Five  $-OH$  group
- D. A straight chain

**Answer:**

12. To increase the solubility of  $CO_2$  gas in soft drinks the bottle is sealed under

- A. Low pressure
- B. High temperature
- C. Constant pressure
- D. High pressure

**Answer:**



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13. A solution of a pair of volatile liquids A and B shows negative deviation from Raoult's law. This is because

A.  $p_A > p_A^\circ x_A$  and  $p_B > p_B^\circ x_B$

B. The intermolecular forces

$$A - A, B - B < A - B$$

C. Both  $\Delta H_{\text{mixing}}$  and  $\Delta V_{\text{mixing}}$  are positive.

D. All of the above

**Answer:**



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14. The structure of  $XeF_6$  is

- A. Distorted Octahedral
- B. Regular Octahedral
- C. Square Pyramidal
- D. Square Planar

**Answer:**



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15. On the basis of  $\Delta H_{\text{bond}}^\circ$ , which of the following has the strongest bond?



A. H - I

B. H - Cl

C. H - F

D. H - Br

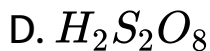
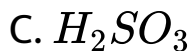
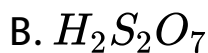
**Answer:**



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**16.** Which of the following oxoacids of Sulphur contains peroxide linkage?

A.  $H_2SO_4$

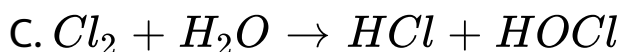
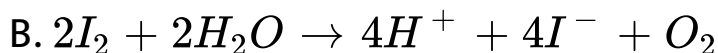
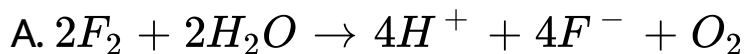


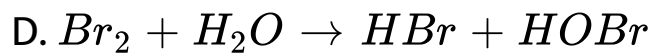
**Answer:**



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**17. Which of the following reactions is not correct?**

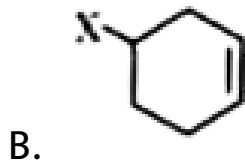
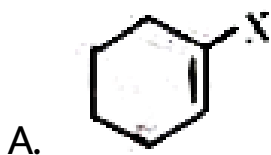




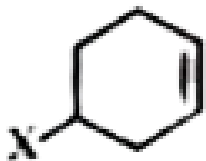
**Answer:**

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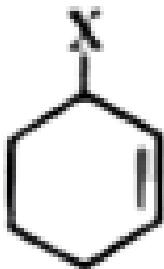
**18.** Which of the following belongs to the class of allylic halides?



C.



D.

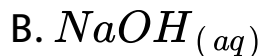
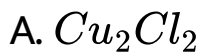


**Answer:**



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**19.** Which reagent will be required for one step conversion of benzenediazonium chloride to phenol?



D. Alcoholic KOH

**Answer:**



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**20.** Assertion (A) : Relative lowering in vapour pressure is colligative property.

Reason (A) : Relative lowering in vapour pressure depends upon mole fraction of pure solvent.

- A. Both (A) and (R) are true and (R) is the correct explanation of (A).
- B. Both (A) and (R) are true, but (R) is not the correct explanation of (A)
- C. (A) is true, but (R) is false
- D. (A) is false, but (R) is true.

**Answer:**



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21. Assertion (A) : ZnO on heating turns yellow.

Reason (R) : Excess  $Zn^{2+}$  ions move to interstitial sites and the electron to neighbouring interstitial sites.

- A. Both (A) and (R) are true and (R) is the correct explanation of (A).
- B. Both (A) and (R) are true, but (R) is not the correct explanation of (A)
- C. (A) is true, but (R) is false
- D. (A) is false, but (R) is true.

**Answer:**



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22. Assertion (A) :  $F_2$  is a powerful oxidizing agent.

Reason (R) : Fluorine shows anomalous behaviour.

- A. Both (A) and (R) are true and (R) is the correct explanation of (A).
- B. Both (A) and (R) are true, but (R) is not the correct explanation of (A)
- C. (A) is true, but (R) is false
- D. (A) is false, but (R) is true.



**Answer:**



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**23.** Assertion (A) : Monoclinic Sulphur is stable at room temperature.

Reason (R) : Both Rhombic Sulphur and Monoclinic Sulphur have  $S_8$  molecules.

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

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

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

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

**Answer:**



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**24.** Assertion (A) : Reaction of  $(CH_3)_3C - Br$  with  $CH_3ONa$  gives majority 2-methylpropene.

Reason (R) :  $CH_3ONa$  acts a strong base.

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

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

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

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

**Answer:**



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**Section C**

## 1. Match the following

	I	II
i.	$Cl_{2(g)}$	A. Inert at room temperature
ii.	$He_{(g)}$	B. Reducing agent
iii.	$N_{2(g)}$	C. Bleaching agent
iv.	$F_{2(g)}$	D. Low solubility in blood
v.	Moist $SO_{2(g)}$	

Which of the following is the best matched option ?

A. i-B,ii-A,iii-c,iv-D

B. i-D,ii-B,v-A,iii-C

C. i-C,ii-D,iii-A,v-B

D. i-A,ii-D,iii-C,iv-B

**Answer:**



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2. Which of the following analogies is correct ?

A. Chloroform-acetone : Positive deviation : :

Ethanol- $H_2O$  : Negative deviation.

B.  $p_A = p_A^\circ - x_A$  : Henry's law : :  $p = K_H \cdot x$  :

Raoult's law.

C.  $P_{\text{Total}} = p_A + p_B$  : Non-ideal solution : :

$P_{\text{Total}} > p_A + p_B$  : Ideal solution

D.  $\pi = CRT$  : Osmotic pressure ::  $P > \pi$  :

Reverse osmosis.

**Answer:**



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**3. Complete the following analogy :**

o-nitrophenol : A :: o-cresol : B

A. A : more acidic than phenol B: less acidic than phenol

B. A : less acidic than phenol B: more acidic than phenol

C. A : more acidic than phenol B: more acidic than phenol

D. A : less acidic than phenol B : less acidic than phenol

**Answer:**

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4. Read the passage given below and answer the following question

No crystal is found to be perfect at room temperature . These defects are basically

irregularities in the arrangement of constituents particles. These defects can be stoichiometric or Non-stoichiometric. Stoichiometric defects are of two types : Schottky and Frenkel defect. Schottky is basically a vacancy defect while Frenkel is an interstitial defect. Due to non-stoichiometric defects , the formula of the ionic compound is different from the ideal formula. These defects are also of two types : (i) Metal excess defect and (ii) Metal deficiency defect.

What type of defect is shown by  $\text{AgCl}$  ?

A. Schottky defect

B. Frenkel defect



C. Metal excess defect

D. Metal deficiency defect

**Answer:**



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5. Which of the following defects lowers the density of the crystal but does not affect the stoichiometry ?

A. Schottky defect

B. Frenkel defect

C. Metal excess defect

D. Metal deficiency defect

**Answer:**



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**6.** Excess of potassium makes KCl crystals violet due to the formation of

A. Cation vacancies

B. Anion vacancies

C. F-centres

## D. Interstitial defect

**Answer:**



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