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## Questions Paper

**SERIES: SSJ/2 | CODE : 056/2/4 | SET-4****SUBJECT : CHEMISTRY****TIME ALLOWED: 90 MINUTES****MAXIMUM MARKS : 35****NOTE**

- (i) Please check that this question paper contains 18 printed pages.
- (ii) Please check that this question paper contains 55 multiple choice questions (MCQs.)
- (iii) QP Code given on the right hand side of the question paper should be written at the appropriate place of the OMR Sheet by the candidates.
- (iv) 20 minute additional time has been allotted to read this question paper prior to actual time of commencement of examination.

**GENERAL INSTRUCTIONS:**

- (i) This question paper contains 55 questions out of which 45 questions are to be attempted. All questions carry equal marks.
- (ii) The question paper consists of three Sections – Section A, B and C.
- (iii) Section – A contains 25 questions. Attempt any 20 questions from Q. No. 01 to 25.
- (iv) Section – B contains 24 questions. Attempt any 20 questions from Q.No. 26 to 49.
- (v) Section – C contains 6 questions. Attempt any 5 questions from Q.No. 50 to 55.
- (vi) The first 20 Questions attempted in Section – A & Section – B and first 5 questions attempted in Section – C by a candidate will be evaluated.
- (vii) There is only one correct option for every multiple choice question (MCQ). Marks will not be awarded for answering more than one option.
- (viii) There is no negative marking.

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SECTION – A

This Section consists of **25 multiple choice** questions with overall choice to **attempt any 20 questions**. In case more than desirable number of questions are attempted, only first **20 questions** will be considered for evaluation.

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  
 (a)  $PQ_2$  (b)  $P_2Q$  (c) PQ (d)  $PQ_3$

Ans. (b)

Sol. Effective number of Q ions in unit cell = 4  
 (as Q ions form ccp lattice)  
 Effective number of P ion in unit cell = 8  
 (as P ions occupies in all tetrahedral side)  
 So, formula of ionic compound =  $P_8Q_4$   
 =  $P_2Q$

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

Ans. (c)

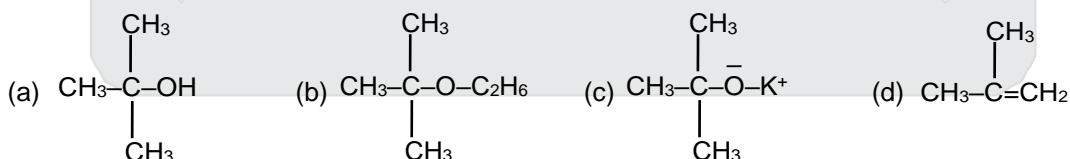
Sol. Molarity (M) =  $\frac{\text{number of moles of solute}}{\text{Volume of solution (in L)}}$   
 as Temp.  $\uparrow$ , V  $\rightarrow$  Volume  $\uparrow$  so M  $\downarrow$

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  $\Delta V_{\text{mix}} < 0$

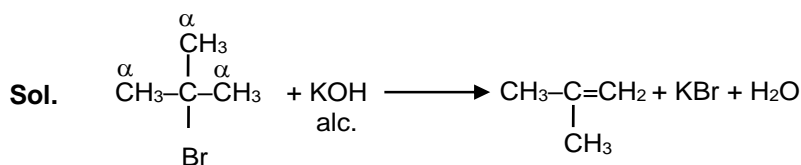
Ans. (a)

Sol. For an ideal solution  $\Delta H_{\text{mix}} = 0$ ,  $\Delta V_{\text{mix}} = 0$

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



Ans. (d)



2-Bromo-2-methylpropane

in 3R-x elimination reaction > substitution reaction

KOH  $\rightarrow$  gives elimination

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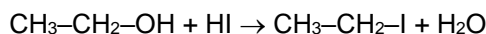
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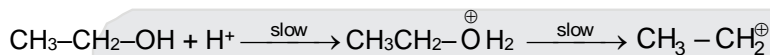
5. Which of the following intermediates is formed in the reaction shown below?



- (a)  $\text{CH}_3\text{CH}_2\text{OH}_2^{\oplus}$  (b)  $\text{CH}_3\text{-CH}_2^{\oplus}$   
 (c) Both  $\text{CH}_3\text{CH}_2\text{OH}_2^{\oplus}$  and  $\text{CH}_3\text{-CH}_2^{\oplus}$  (d)  $\text{CH}_3\text{CH}_2\text{-O}^{\oplus}\text{-CH}_2\text{-CH}_3$

Ans. (c)

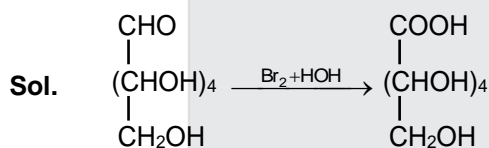
Sol. Protonation of alcohol and formation of intermediate



6. Glucose is oxidized by  $\text{Br}_2$  water to give



Ans. (b)

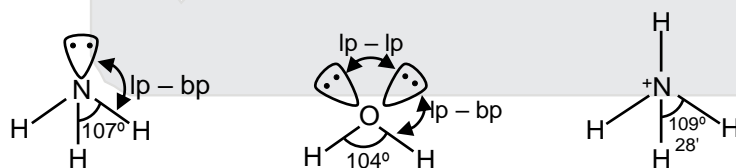
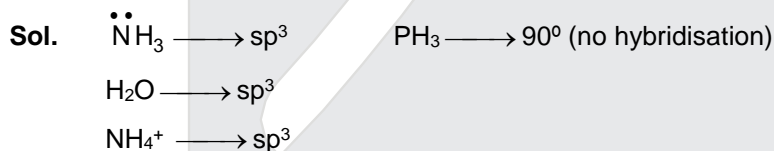


$\text{Br}_2 + \text{HOH} \longrightarrow$  weak oxidising agent.

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

- (a)  $\text{NH}_3$  (b)  $\text{H}_2\text{O}$  (c)  $\text{PH}_3$  (d)  $\text{NH}_4^+$

Ans. (d)



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

- (a) Oxygen (b) Sulphur (c) Selenium (d) Tellurium

Ans. (a)

Sol. Group : 16

O, S, Se, Te, Po

Oxygen  $\nrightarrow$  +2 higher

due to absence of -d- orbital

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9. Which of the following is a molecular solid ?

- (a) KCl (b) SiO<sub>2</sub> (c) Cu (d) Ar

Ans. (d)

Sol. KCl – Ionic solid

SiO<sub>2</sub> – Covalent or network solid

Cu – Metallic solid

Ar – Molecular solid (dispersion or London forces)

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

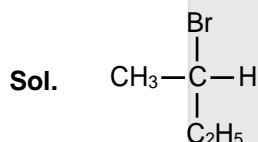
Ans. (c)

Sol. For determination of molar mass of polymers and proteins, measurement of osmotic pressure (O.P.) is used for solution. Because O.P. measurement is being to be accurate as comparable to other.

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

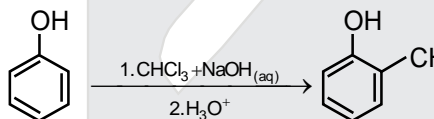


Ans. (b)



Chiral molecule ∵ four valences of C-atom satisfied by four different group or atoms.

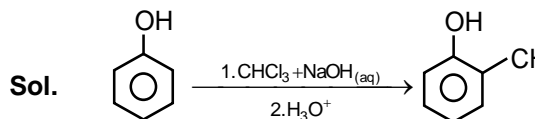
12. The reaction :



is an example of

- (a) Reimer-Tiemann reaction (b) Kolbe's reaction  
(c) Williamson's synthesis (d) Wurtz reaction

Ans. (a)



13. Which of the following is fibrous protein ?

- (a) Albumin (b) Keratin (c) Insulin (d) Globin

Ans. (b)

Sol. Fact : Example of fibrous protein ∵ keratin

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14. The acid strength of HF, HCl, HBr and HI increases in the order  
 (a) HF < HCl < HBr < HI  
 (b) HI < HBr < HCl < HF  
 (c) HBr < HI < HCl < HF  
 (d) HF < HBr < HI < HCl

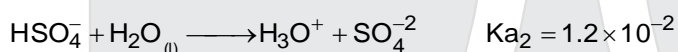
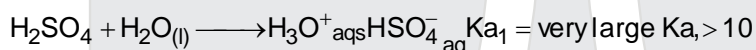
Ans. (a)

Sol. Acid strength : HI > HBr > HCl > HF  
 bond dissociation energy  
 increased from I → F

15. Which is not correct about concentrated H<sub>2</sub>SO<sub>4</sub>?  
 (a) Dehydrating agent  
 (b) Oxidising Agent  
 (c) Ka<sub>2</sub> > Ka<sub>1</sub>  
 (d) It forms two series of salts.

Ans. (c)

Sol. H<sub>2</sub>SO<sub>4</sub> ionises in two steps



Ka<sub>1</sub> > Ka<sub>2</sub>

16. Pure water boils at 373.15 K and nitric acid boils at 359.15 K. An azeotropic mixture of H<sub>2</sub>O and HNO<sub>3</sub> boils at 393.55 K. 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.

Ans. (d)

Sol. In azeotropic mixture in distillation distill over in the same composition as that of the mix. In liquid phase

17. A 5% (by mass) solution of glucose (molar mass=180 g mol<sup>-1</sup>) is isotonic with 1% solution (by mass) of a substance 'X' The molar mass of 'X' is  
 (a) 36 g mol<sup>-1</sup>                      (b) 18 g mol<sup>-1</sup>                      (c) 72 g mol<sup>-1</sup>                      (d) 900 g mol<sup>-1</sup>

Ans. (a)

Sol. For isotonic solution  $\pi_1 = \pi_2$  (as fume that)  
 $C_1 = C_2$

Moles of glucose = moles of substance

$$\frac{5}{180} = \frac{1}{(mm)}$$

$$(mm) \frac{180}{5} = 36 \text{ gm/Mole}$$

18. An S<sub>N</sub>1 reaction of an enantiomerically pure chiral alkyl halide given a product  
 (a) with retention of configuration  
 (b) with inversion of configuration  
 (c) with racemisation  
 (d) with partial racemisation






Ans. (c)

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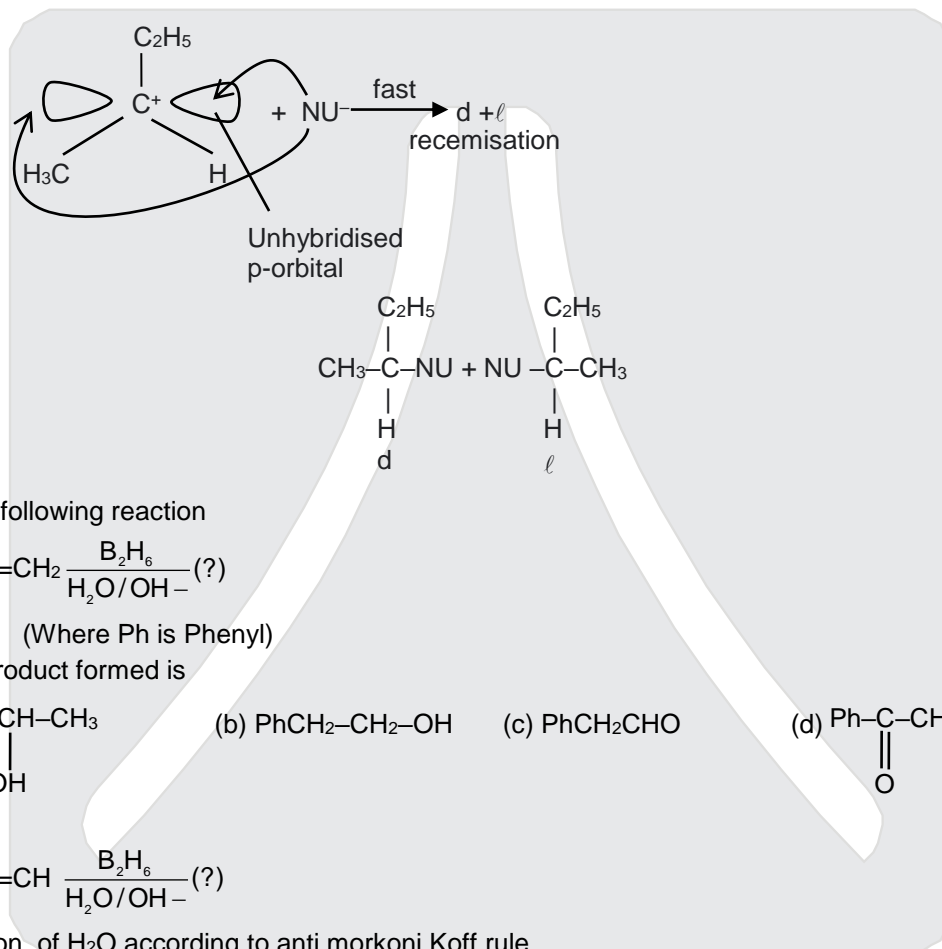
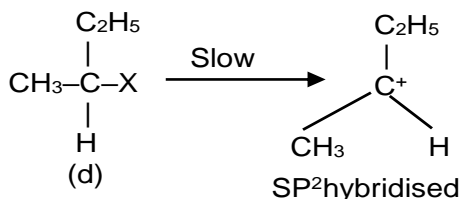
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Sol.  $S_N1$  reaction  
Intermediate is carbocation



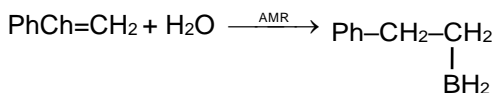
19. In the following reaction  
 $\text{PhCH}=\text{CH}_2 \xrightarrow[\text{H}_2\text{O}/\text{OH}^-]{\text{B}_2\text{H}_6} (?)$   
(Where Ph is Phenyl)  
The product formed is

- (a)  $\text{PhCH}(\text{OH})-\text{CH}_3$       (b)  $\text{PhCH}_2-\text{CH}_2-\text{OH}$       (c)  $\text{PhCH}_2\text{CHO}$       (d)  $\text{Ph}-\text{C}(=\text{O})-\text{CH}_3$

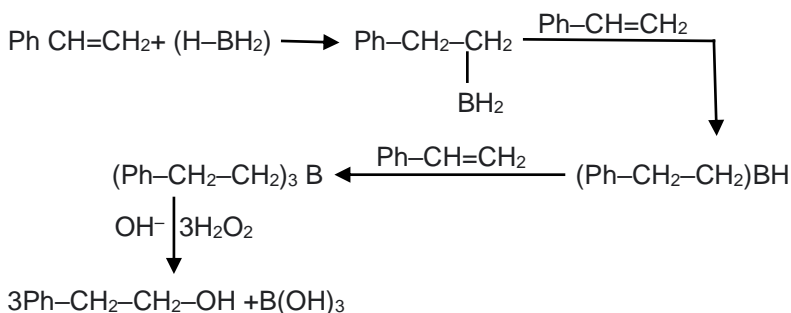
Ans. (b)

Sol.  $\text{PhCH}=\text{CH}_2 \xrightarrow[\text{H}_2\text{O}/\text{OH}^-]{\text{B}_2\text{H}_6} (?)$

Addition of  $\text{H}_2\text{O}$  according to anti Markovnikov's rule



**Mechanism**



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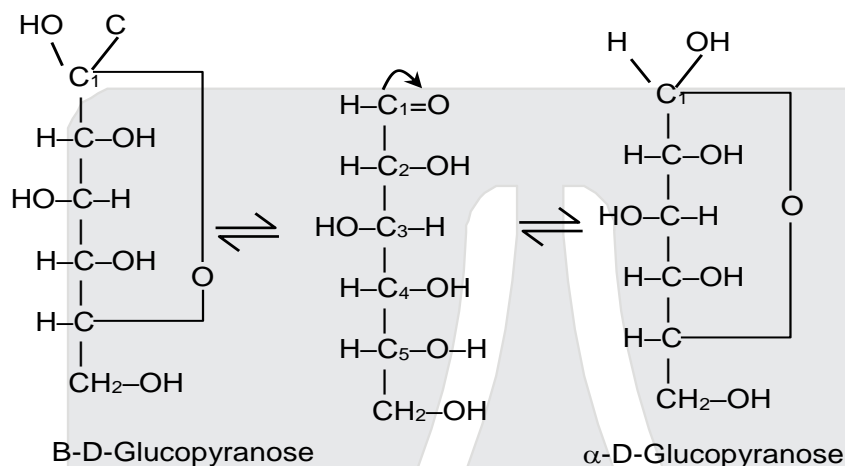
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20.  $\alpha$ -D-Glucopyranose and  $\beta$ -D-Glucopyranose are  
 (a) Isomers which differ in configuration at C-5 (b) Geometrical isomers  
 (c) Functional isomers (d) Anomers

Ans. (d)

Sol. Anomers  $\rightarrow$  differ in configuration at C<sub>1</sub> carbon atom



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

Ans. (a)

Sol.  $F \rightarrow 1s^2, 2s^2, 2p^5$

Valence shell



Absence of d-orbital in valence shell

22. The formation of  $O_2^+[PtF_6]^-$  is the basis for the formation of Xenon fluoride. This is because  
 (a)  $O_2$  and Xe have comparable electro negativities  
 (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.

Ans. (c)

Sol.  $O_2 (I_e) = 1175 \text{ kJ/mole}$

$Xe (I_e) = 1170 \text{ kJ/mole}$

23. Chlorobenzene reacts with  $Cl_2$  in the presence of  $FeCl_3$  given ortho and para chloro compounds. The reaction is

- (a) Nucleophilic substitution reaction (b) Nucleophilic addition reaction  
 (c) Electrophilic addition reaction (d) Electrophilic substitution reaction

Ans. (d)

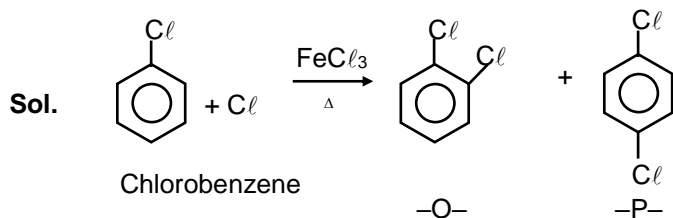
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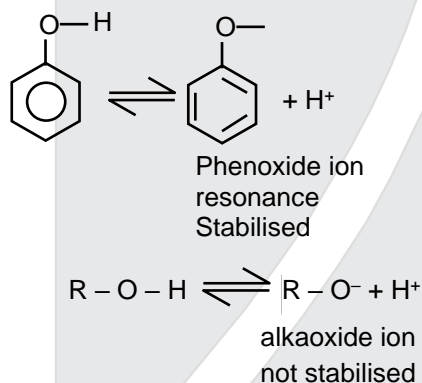
$E^+ \rightarrow Cl^+$  (electrophile)

$FeCl_3 \rightarrow FeCl_4^- + Cl^+$

24. Phenol is more acidic than ethanol because
- Ethoxide ion is more stable than Phenoxide ion.
  - Phenoxide ion is more stable than Ethoxide ion.
  - Phenol undergoes electrophilic substitution reaction.
  - Phenol undergoes protonation easily.

Ans. (b)

Sol.  $C_6H_5OH > C_2H_5-OH$   
Phenol      Ethanol



25. Which of the following statements is not correct about amorphous solids?
- Amorphous solids are anisotropic.
  - Amorphous solids have a tendency to flow.
  - Amorphous solids have short range order.
  - Amorphous solids have irregular shape.

Ans. (a)

Sol. Fact  $\rightarrow$  Properties of amorphous solid

### SECTION – B

Section-B consists 24 questions. Attempt any 20 questions from this section,  
20 Questions attempted first, will only be evaluated.

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

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Sol.  $d = \frac{z \times M}{a^3 \times N_A}$

$M = 96 \text{ gm/mole}$

$a = 4 \times 10^{-8} \text{ cm}$

$d = 10 \text{ g cm}^{-3}$

$z = ?$

$z = \frac{d \times a^3 \times N_A}{M}$

$z = \frac{10 \times (4 \times 10^{-8})^3 \times 6 \times 10^{23}}{96}$

$z = 4$

fcc crystal

27. When 2.5 g of a non-volatile solute was dissolved in 50mL of water, it gave boiling point elevation of 0.52°C. The molar mass of the solute is ( $K_b$  for water = 0.52 Km<sup>-1</sup>).

(a) 100 g mol<sup>-1</sup>                      (b) 50 g mol<sup>-1</sup>                      (c) 25 g mol<sup>-1</sup>                      (d) 75 g mol<sup>-1</sup>

Ans. (b)

Sol.  $\Delta T_b = i \times k_b \times m$                       density of water = 1 gm/ml

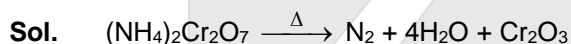
$0.52 = 1 \times 0.52 \times \frac{2.5}{(\text{mm})} \times \frac{1000}{50}$

$\text{mm} = 50 \text{ gm/mole}$

28. Which of the following gas is released on heating ammonium dichromate (NH<sub>4</sub>)<sub>2</sub>Cr<sub>2</sub>O<sub>7</sub>?

(a) NO<sub>2</sub>                      (b) CO<sub>2</sub>                      (c) NO                      (d) N<sub>2</sub>

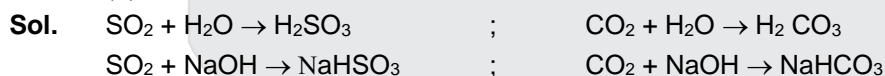
Ans. (d)



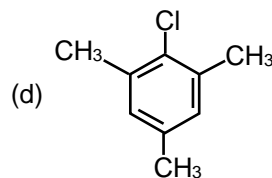
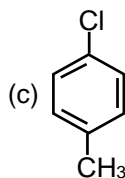
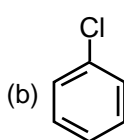
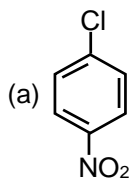
29. On its reaction with water and alkalis, the behaviour of SO<sub>2(g)</sub> is very similar to that of which gas?

(a) NO<sub>2</sub>                      (b) CO<sub>2</sub>                      (c) NH<sub>3</sub>                      (d) N<sub>2</sub>O

Ans. (b)



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



Ans. (a)

Sol. In nucleophilic substitution reaction intermediate is carbanion.

Stability of  $\bar{C} \propto -I, -M$

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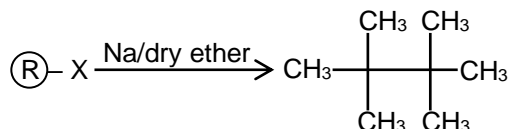
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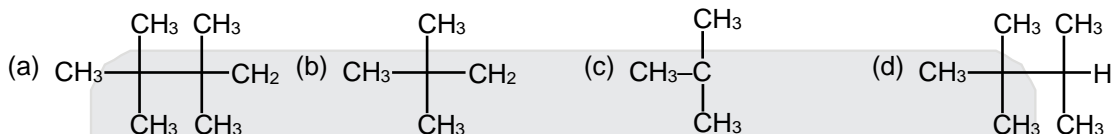
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31. In the following reaction

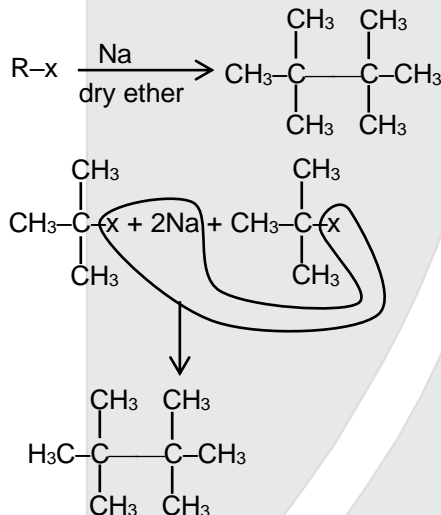


$\textcircled{R}$  in the above reaction is

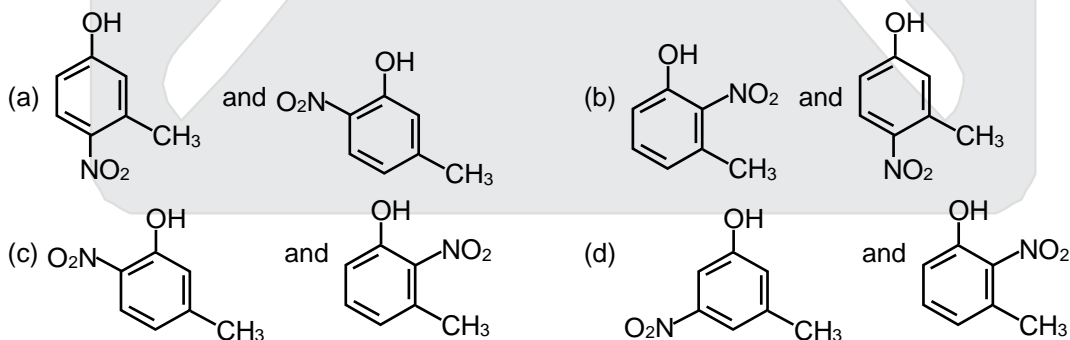


Ans. (c)

Sol.

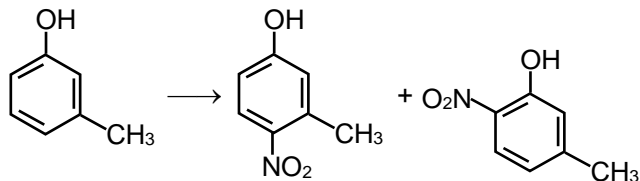


32. The structure(s) of the major product(s) expected from the mononitration of 3-methylphenol will be



Ans. (a)

Sol. Mononitration of 3-methylphenol



in phenol -OH group is O, P directed.

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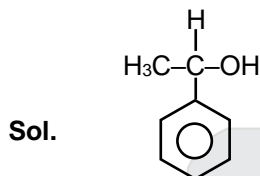
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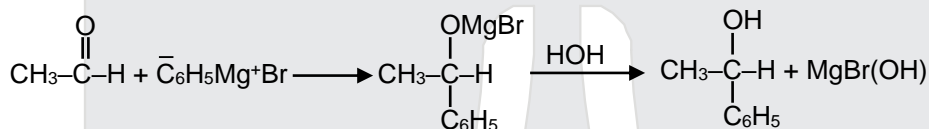
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33. 1-Phenylethanol may be prepared by the reaction of C<sub>6</sub>H<sub>5</sub>Br with  
 (a)  $\text{CH}_3-\overset{\text{O}}{\parallel}{\text{C}}-\text{CH}_3$       (b) CH<sub>3</sub>-CHO      (c) HCHO      (d) CH<sub>3</sub>-CH<sub>2</sub>-CHO

Ans. (b)



1-Phenylethanol



34. Two among the three components of DNA are 2-deoxyribose and a nitrogen containing heterocyclic base. The third components is :

(a) D-ribose      (b) Thymine      (c) Guanine      (d) Phosphoric acid

Ans. (d)

Sol. DNA → 2-deoxyribose + base + phosphate

35. Which among the following bases is usually not present in RNA ?

(a) Uracil      (b) Thymine      (c) Adenine      (d) Guanine

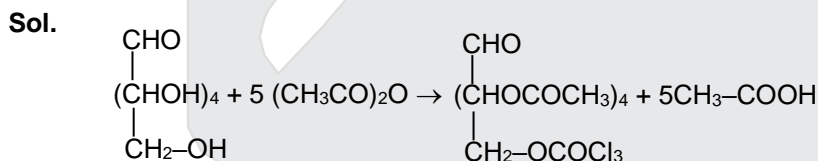
Ans. (b)

Sol. RNA      DNA  
Uracil      Thymine

36. Glucose on reaction with (CH<sub>3</sub>CO)<sub>2</sub>O forms glucose pentaacetate which confirms the presence of :

(a) -CHO group      (b) -COOH group      (c) Five -OH groups      (d) A straight chain

Ans. (c)



Pentaacetate glucose

Five → OH group

37. To increase the solubility of CO<sub>2</sub> gas in soft drinks, the bottle is sealed under :  
 (a) Low pressure      (b) High temperature      (c) Constant pressure      (d) High pressure

Ans. (d)

Sol. P ↑ CO<sub>2</sub> solubility increased

38. A solution of a pair of volatile liquids A and B shows negative deviation from Roults law. This is because:

(a) p<sub>A</sub> > p<sub>A</sub><sup>o</sup> x<sub>A</sub> and p<sub>B</sub> > p<sub>B</sub><sup>o</sup> x<sub>B</sub>      (b) The intermolecular forces A-A, B-B < A-B  
 (c) Both ΔH<sub>mixing</sub> and ΔV<sub>mixing</sub> are positive      (d) All of the above

Ans. (b)

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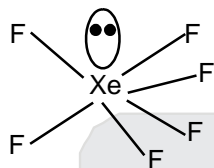
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39. The structure of  $\text{XeF}_6$  is :

- (a) Distorted Octahedral (b) Regular Octahedral  
(c) Square pyramidal (d) Square planar

Ans. (a)

Sol.  $\text{XeF}_6 \rightarrow \text{sp}^3\text{d}^2$  hybridisation



distorted octahedral

40. On the basis of  $\Delta H^\circ_{\text{bond}}$ , which of the following has the strongest bond ?

- (a) H-I (b) H-Cl (c) H-F (d) H-Br

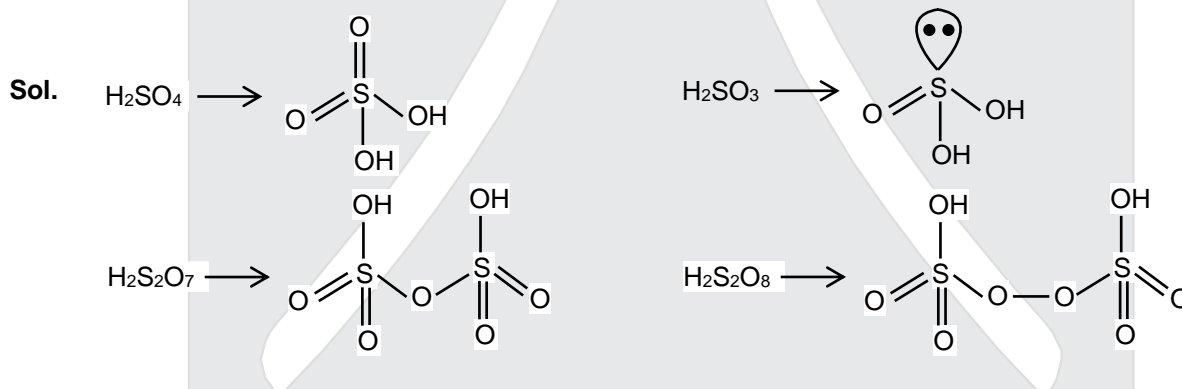
Ans. (c)

Sol. H-F strongest bond due to small size of F atom

41. Which of the following oxoacids of Sulphur contains peroxide linkage ?

- (a)  $\text{H}_2\text{SO}_4$  (b)  $\text{H}_2\text{S}_2\text{O}_7$  (c)  $\text{H}_2\text{SO}_3$  (d)  $\text{H}_2\text{S}_2\text{O}_8$

Ans. (d)

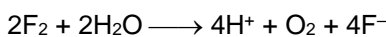


42. Which of the following reactions is not correct?

- (a)  $2\text{F}_2 + 2\text{H}_2\text{O} \rightarrow 4\text{H}^+ + 4\text{F}^- + \text{O}_2$  (b)  $2\text{I}_2 + 2\text{H}_2\text{O} \rightarrow 4\text{H}^+ + 4\text{I}^- + \text{O}_2$   
(c)  $\text{Cl}_2 + \text{H}_2\text{O} \rightarrow \text{HCl} + \text{HOCl}$  (d)  $\text{Br}_2 + \text{H}_2\text{O} \rightarrow \text{HBr} + \text{HOBr}$

Ans. (b)

Sol.  $\text{F}_2 \rightarrow$  oxidises water to oxygen.

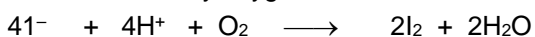


$\text{Cl}_2$ ,  $\text{Br}_2$  react with water and form.

hydrohalic and hypohalous acid

$\text{I}_2 \rightarrow$  reaction with water is nonspontaneous.

$\text{I}^-$  can be oxidized by oxygen in acidic medium.



aq. aq. (g) (s) (l)

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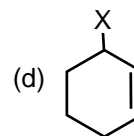
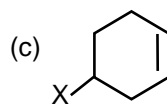
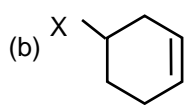
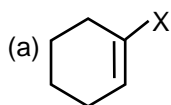
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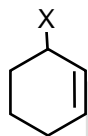
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43. Which of the following belongs to the class of allylic halides ?



Ans. (d)

Sol. Allylic halides → Halogen atom Just adjacent to C=C



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

(a)  $\text{Cu}_2\text{Cl}_2$

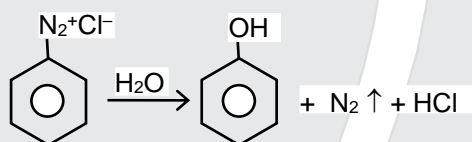
(b)  $\text{NaOH}_{(\text{aq})}$

(c)  $\text{H}_2\text{O}$

(d) Alcoholic KOH

Ans. (c)

Sol.



Benzenediazonium Chloride

Given below are the questions (45 – 49) labelled as Assertion (A) and Reason (R). Select the most appropriate answer from the options given below :

(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.

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

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

Ans. (c)

Sol. **Formulae:**

$$\frac{P_1^\circ - P_1}{P_1^\circ} = x$$

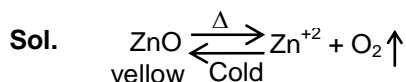
$$x = \frac{n_1}{n_1 + n_2}$$

x = mole fraction of solute

46. **Assertion (A)** : ZnO on heating turns yellow.

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

Ans. (a)



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47. **Assertion (A)** :  $F_2$  is a powerful oxidizing agent.  
**Reason (R)** : Fluorine shows anomalous behaviour.

**Ans.** (b)

**Sol.**  $F \rightarrow$  powerful oxidizing agent

Due to  $\rightarrow$  (i) low enthalpy of dissociation  $F - F$  bond.

(ii) high hydration enthalpy of  $F^-$

$F \rightarrow$  anomalous behavior

Due to (i) IE, EN and electrode potential higher

(ii) Covalent radii, mp, bp, eA,  $\rightarrow$  low

$F - F$  (bond dissociation energy low)

(iii) absence of  $d$ -orbital

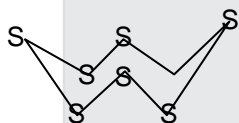
48. **Assertion (A)** : Monoclinic Sulphur is stable at room temperature.

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

**Ans.** (d)

**Sol.** Rhombic sulphur  $\rightarrow$  Stable at room temperature.

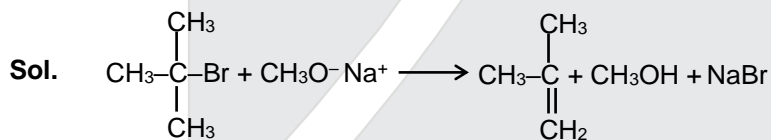
$S_R$  and  $S_M \rightarrow$  both have  $S_8$  molecule



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

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

**Ans.** (a)



Because  $\rightarrow$  sodium methoxide is a strong nucleophile as well as a strong base in  $3 R - x \rightarrow$  elimination reaction predominates over substitution.

### SECTION - C

Section-C consists 6 questions. Attempt any 5 questions from this section.

50. 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

**Ans.** (c)

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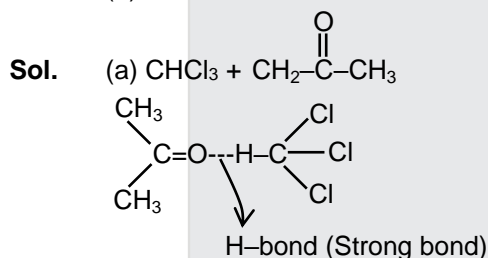
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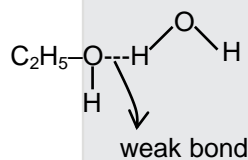
- Sol.**  $\text{Cl}_{(g)} \rightarrow$  bleaching agent  
 $\text{He}_{(g)} \rightarrow$  low solubility in bond  
 $\text{N}_{2(g)} \rightarrow$  inert at room temperature  
 Most  $\text{SO}_{2(g)} \rightarrow$  reducing agent

- 51.** Which of the following analogies is correct ?  
 (a) Chloroform-acetone : Positive deviation : : Ethanol- $\text{H}_2\text{O}$  : Negative deviation.  
 (b)  $P_A = p_A^\circ \cdot X_A$  : 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.

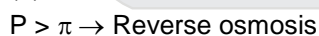
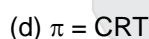
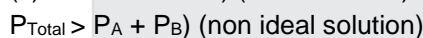
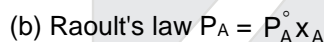
**Ans.** (d)



Negative deviation



positive deviation



- 52.** 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

**Ans.** (a)

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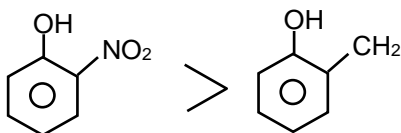
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Sol. -O- nitrophenol is more acidic than.

-O- cresol



$$K_a \propto \frac{-I, -M}{+I, +M}$$

**Case :** Read the passage given below and answer the following questions 53-55.

No crystal is found to be perfect at room temperature. These defects are basically irregularities in the arrangement of constituent 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.

53. What type of defect is shown by AgCl?

- (a) Schottky defect (b) Frenkel defect  
(c) Metal excess defect (d) Metal deficiency defect

Ans. (b)

Sol. Frenkel defect → large difference in the size of cation and anion e.g. AgCl

54. 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

Ans. (a)

Sol. Schottky defect → cation and anion missing from their lattice site therefore density of the crystal decreases.

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

- (a) Cation vacancies (b) Anion vacancies  
(c) F-centres (d) Interstitial defect

Ans. (c)

Sol. In the KCl crystals excess of k given violet colour. due to the presence of e<sup>-</sup> in place of anion. e<sup>-</sup> centre is called F-centre.

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