Practice Test – 01 **WBJEE BANGLA**

CHEMISTRY

Section – A

Multiple Choice Question (1 mark each) 1 × 30 = 30

1. The first ionisation potential of Na is $5.1eV$. The value of electron gain enthalpy of Na^+ will be

(1) $-2.55eV$ (2) $-5.1eV$

(3) $-10.2eV$ (4) $+2.55eV$

2. Which one of the following compounds has sp^2 - hybridisation?

(1) CO_2 (2) SO_2

(3) N_2O (4) CO

3. Number of electron deficient molecules among the following PH_3, B_2H_6, CCl_4, NH_3, LiH and BCl_3 is

(1) 0 (2) 1

(3) 2 (4) 3

4. In which one of the following equilibria, $K_p \neq K_C$?

(1) $2C(s)+O_2(g) \rightleftharpoons 2CO(g)$

(2) $2HI(g) \rightleftharpoons H_2(g)+I_2(g)$

(3) $NO_2(g)+SO_2(g) \rightleftharpoons NO(g)+SO_3(g)$

(4) $2NO(g) \rightleftharpoons N_2(g)+O_2(g)$

5. An acidic buffer solution can be prepared by mixing the solution of

(1) acetate and acetic acid

(2) ammonium chloride and ammonium hydroxide

(3) sulphuric acid and sodium sulphate

(4) sodium chloride and sodium hydroxide

6. What would be the molality of 20% (mass/mass) aqueous solution of KI? (Molar mass of KI = 166 g mol^{-1})

(1) 1.48 (2) 1.51

(3) 1.35 (4) 1.08

7. $Zn\left|Zn^{2+}(a=0.1M)\right|| Fe^{2+}(a=0.01M)\left|Fe\right.$

The emf of the above cell is 0.2905 V. Equilibrium constant for the cell reaction is

(1) $10^{0.32/0.059}$

(2) $10^{0.32/0.0295}$

(3) $10^{0.26/0.0295}$

(4) $10^{0.32/0.295}$

8. For a reaction of order n, the unit of the rate constant is

(1) $mol^{1-n}\ L^{1-n}\ s$ (2) $mol^{1-n}\ L^{2n}\ s^{-1}$

(3) $mol^{1-n}\ L^{n-1}\ s^{-1}$ (4) $mol^{1-n}\ L^{1-n}\ s^{-1}$

9. The number of moles of $KMnO_4$ that will be needed to react completely with one mole of ferrous oxalate in acidic medium is

(1) $\frac{2}{5}$ (2) $\frac{3}{5}$

(3) $\frac{4}{5}$ (4) 1

10. The ground state energy of hydrogen atom is $-13.6eV$. The energy of second excited state of He^+ ion in eV is

(1) -54.4 (2) -3.4

(3) -6.04 (4) -27.2

11. The major product formed in the following reaction is $CH_3CH=CHCH(CH_3)_2 \xrightarrow{HBr}$

(1) $CH_3CH(Br)CH_2CH(CH_3)_2$

(2) $CH_3CH_2CH(Br)CH(CH_3)_2$

(3) $Br(CH_2)_3CH(CH_3)_2$

(4) $CH_3CH_2CH_2C(Br)(CH_3)_2$

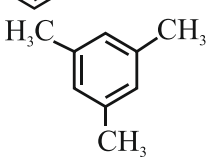
12. For the given reaction

$$HC=CHBr \xrightarrow[(ii)\text{Red hot iron tube iron, } 873\ K]{(i)NaNH_2} (A)$$

(Major product)

What is A?

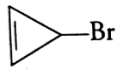
(1) 

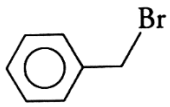
(2) 

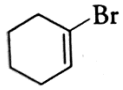
(3) $CH_3CH_2CH_2NH_2$

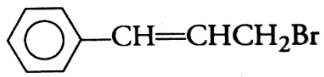
(4) $CH=CH-NH_2$ 

13. Compound from the following that will not produce precipitate on reaction with $AgNO_3$ is

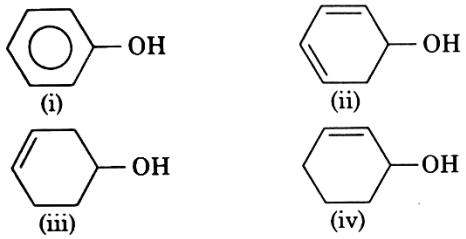
(1) 

(2) 

(3) 

(4) 

14. Decreasing order of dehydration of the following alcohols is



(1) (iv)> (ii) > (iii) > (i)

(2) (i) > (iv)> (ii) > (iii)

(3) (ii) > (i) > (iv)> (iii)

(4) (ii) > (iv)> (iii) > (i)

15. Hex-4-ene-2-ol on treatment with PCC gives ' A '. ' A ' on reaction with sodium hypoiodite gives ' B ', which on further heating with soda lime gives ' C '. The compound ' C ' is

(1) 2-pentene (2) proponaldehyde

(3) 2-butene (4) 4-methylpent-2-ene

16. Considering the basic strength of amines in aqueous solution, which one has the smallest pK_b value?

(1) $(CH_3)_2NH$

(2) CH_3NH_2

(3) $(CH_3)_3N$

(4) $C_6H_5NH_2$

17. A positive carbylamine test is given by

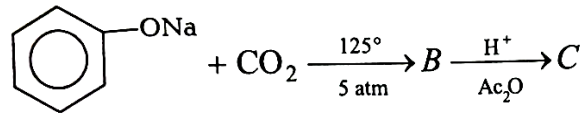
(1) N,N-dimethylaniline

(2) 2, 4-dimethylaniline

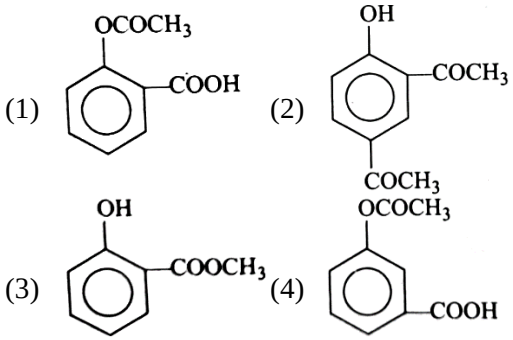
(3) N-methyl-o-methylaniline

(4) p-methylbenzylamine

18. Sodium phenoxide when heated with CO_2 under pressure at 125°C yields a product which on acetylation produces C.

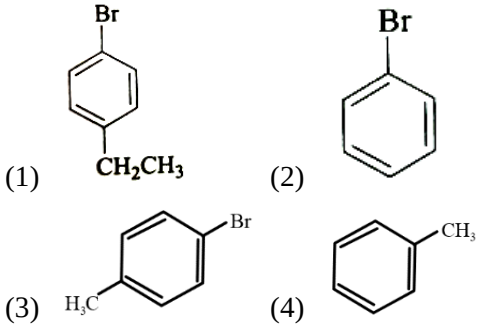


The major product C would be

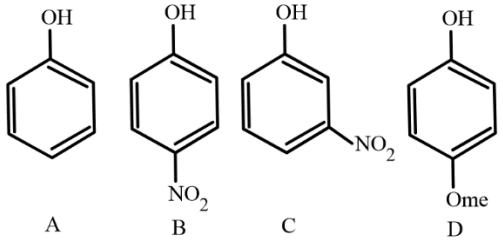


19. A $\xrightarrow[(iii)H_3O^+]{(i)Cl_2,\Delta \; (ii)CN^-}$ 4-Bromophenyl acetic acid.

In the above reaction 'A' is



20. The increasing order of the pKa values of the following compounds is



(1) C < B < A < D (2) B < C < D < A

(3) D < A < C < B (4) B < C < A < D

21. The Primary and secondary valencies of cobalt respectively in $[Co(NH_3)_5Cl]Cl_2$ are

(1) 3 and 6 (2) 2 and 6

(3) 3 and 5 (4) 2 and 8

22. The octahedral diamagnetic low spin complex among the following is

(1) $[CoF_6]^{3-}$ (2) $[Co(NH_3)_6]^{3+}$

(3) $[NiCl_4]^{2-}$ (4) $[CoCl_6]^{3-}$

23. The Spin only magnetic moment value (in Bohr magneton units) of $Cr(CO)_6$ is

(1) 0 (2) 2.84

(3) 4.90 (4) 5.92

24. The order of the oxidation state of the phosphorus atom in H_3PO_2, H_3PO_4, H_3PO_3 and $H_4P_2O_6$ is

(1) $H_3PO_4 > H_3PO_2 > H_3PO_3 > H_4P_2O_6$

(2) $H_3PO_4 > H_4P_2O_6 > H_3PO_3 > H_3PO_2$

(3) $H_3PO_2 > H_3PO_3 > H_4P_2O_6 > H_3PO_4$

(4) $H_3PO_3 > H_3PO_2 > H_3PO_4 > H_4P_2O_6$

25. The correct statement among the following is

(1) $(SiH_3)_3N$ is planar and less basic than $(CH_3)_3N$

(2) $(SiH_3)_3N$ is pyramidal and more basic than $(CH_3)_3N$

(3) $(SiH_3)_3N$ is pyramidal and less basic than $(CH_3)_3N$

(4) $(SiH_3)_3N$ is planar and more basic than $(CH_3)_3N$

26. The coagulating power of electrolytes having ions Na^+ Al^{3+} and Ba^{2+} for arsenic sulphide sol increases in the order

(1) $Al^{3+} < Ba^{2+} < Na^+$

(2) $Na^+ < Ba^{2+} < Al^{3+}$

(3) $Ba^{2+} < Ba^{2+} < Al^{3+}$

(4) $Al^{3+} < Na^+ < Ba^{2+}$

27. The type of hybridisation and number of lone pair(s) of electrons of xe in XeOF4, respectively, are

(1) sp^3d^2 and 1 (2) sp^3d and 2

(3) sp^3d and 1 (4) sp^3d^2 and 2

28. Ion having highest hydration enthalpy among the given alkaline earth metal ions is

(1) Sr^{2+} (2) Ba^{2+}

(3) Be^{2+} (4) Ca^{2+}

29. The ratio of number of atoms present in a simple cubic, body centered cubic and face centered cubic structure are, respectively.

(1) 8: 1 : 6 (2) 1 : 2 : 4

(3) 4 : 2 : 1 (4) 4 : 2 : 3

30. Two faraday of electricity is passed through a solution of $CuSO_4$. The mass of copper deposited at the cathode is (a. mass of Cu = 63.5u)

(1) 0 g (2) 63.5 g

(3) 2 g (4) 127 g

Section – B

Multiple Choice Question (2 marks each) 2 × 5 = 10

31. [X] + H_2SO_4 → [Y] a colourless gas with irritating smell

[Y] + $K_2Cr_2O7+H_2SO_4$ → green solution

[X] and [Y] are

(1) SO_3^{2-}, SO_2 (2) Cl^-, HCl

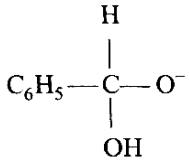
(3) S^{2-}, H_2S (4) CO_3^{2-}, CO_2

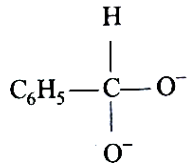
32. In polymer buna-S: 'S' stands for

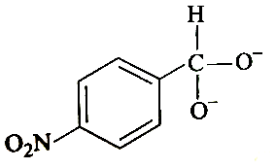
(1) Sulphonation (2) Strength

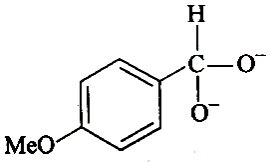
(3) Sulphur (4) styrene

33. In Cannizzaro's reaction, the intermediate which is the best hydride donor is

(1) 

(2) 

(3) 

(4) 

34. Solubility product constant (K_{sp}) of salts of types MX, MX_2 and M_3X at temperature 'T' are 4.0×10^{-8}, 3.2×10^{-14} and 2.7×10^{-15},respectively. Solubilities (mol dm^{-3}) of the salts at temperature 'T' are in the order

(1) $MX > MX_2 > M_3X$

(2) $M_3X > MX_2 > MX$

(3) $MX_2 > M_3X > MX$

(4) $MX > M_3X > MX_2$

35. Given,

(A) $2CO(g)+O_2(g) \rightarrow 2CO_2(g) \rightarrow \Delta H_1^{\theta} = -xkJ\ mol^{-1}$

(B) $C(graphite)+O_{2(g)} \rightarrow CO_{2(g)} \rightarrow \Delta H_2^{\theta} = -ykJ\ mol^{-1}$

The $\rightarrow H^{\theta}$ for the reaction

$C(graphite) + 1/2\ O_2(g) \rightarrow CO(g)$ is

(1) $\frac{x+2y}{2}$ (2) $\frac{x-2y}{2}$

(3) $\frac{2x-y}{2}$ (4) $2y-x$

Section – C

Multiple Choice Question **2 × 5 = 10**

(2 marks each, more than one option correct)

36. Hydrogen bonding plays a central role in which of the following phenomena?

(1) Ice floats in water

(2) Higher Lewis basicity of primary amines than tertiary amines in aqueous solutions

(3) Formic acid is more acidic than acetic acid

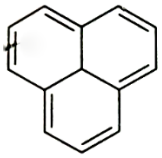
(4) Dimerisation of acetic acid in benzene

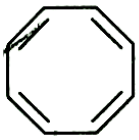
37. An isotone of $^{76}_{32}Ge$ is

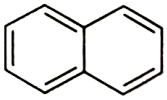
(1) $^{77}_{32}Ge$ (2) $^{77}_{33}As$

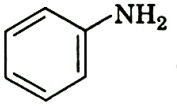
(3) $^{77}_{34}Se$ (4) $^{78}_{34}Se$

38. Which of the following is not an example of benzenoid compound?

(1) 

(2) 

(3) 

(4) 

39. The correct statement(s) about the oxoacids, $HClO_4$ and HClO, is (are)

(1) The central atom in both $HClO_4$ and HClO is sp_3 hybridised

(2) $HClO_4$ is formed in the reaction between Cl_2 and H_2O

(3) The conjugate base of $HClO_4$ is weaker base than H_2O

(4) $HClO_4$ is more acidic than HClO because of the resonance stabilisation of its anion

40. p-chloroaniline and anilinium hydrochloride can be distinguished by

(1) Sandymeyer reaction

(2) $NaHCO_3$

(3) $AgNO_3$

(4) Carbylamine test

ANSWER KEY

SECTION – A

1. (2)
2. (2)
3. (3)
4. (1)
5. (1)
6. (2)
7. (2)
8. (3)
9. (2)
10. (3)
11. (4)
12. (2)
13. (3)
14. (4)
15. (3)
16. (1)
17. (4)
18. (1)
19. (3)
20. (4)
21. (1)
22. (2)
23. (1)
24. (2)
25. (1)
26. (2)
27. (1)
28. (3)
29. (2)
30. (2)

SECTION – B

31. (1)
32. (4)
33. (4)
34. (4)
35. (2)

SECTION – C

36. (1,2,4)
37. (2,4)
38. (1,2)
39. (1,3,4)
40. (3,4)

Hints & Solutions

SECTION – A

1. (2)

$Na \rightarrow Na^+ + e^-$ First IE

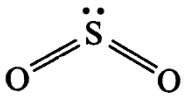
$Na^+ + e^- \rightarrow Na$

Electron gain enthalpy of Na^+ is reverse of (IE)

Because reaction is reverse so $\Delta H(eq) = -5.1eV$

2. (2)

Sulphur in SO_2 is sp^2-hybridised.



Electron pair = 2 (σ-bonds) +1

(lone pair) = 3

Hybridisation = sp^2

3. (3)

Electron deficient species are the one which have less than 8 electrons (or two electrons for H) in their valence shell (incomplete octet). Among the given molecules, B_2H_6 and BCl_3 have incomplete octet.

4. (1)

$2C(s) + O_2(g) \rightleftharpoons 2CO(g)$

$\Delta n_g = n_{product} - n_{reactant}$

$= 2 - (1) = 1$

$\Delta n_g \neq 0 \Rightarrow$ So, $K_p \neq K_c$

5. (1)

Acidic buffer is prepared by mixing weak acid with salt of its conjugate base. Therefore, acetic acid and sodium acetate can be used to prepare acidic buffer.

6. (2)

The molality of 20% (mass / mass) aqueous solution of KI can be calculated by using formula.

$$m = \frac{w_2 \times 1000}{M_2 \times w_1}$$

20% aqueous solution of KI means that $20gm$ of KI is present in $80gm$ solvent.

$$m = \frac{20}{166} \times \frac{1000}{80}$$

$$= 1.506 \approx 1.51 \text{ mol/kg}$$

7. (2)

The cell reaction is :

$Zn + Fe^{2+} \rightleftharpoons Zn^{2+} + Fe$

$E_{cell} = 0.2905$

$$\Rightarrow E = E^\circ - \frac{0.059}{2}\log\frac{[Zn^{2+}]}{[Fe^{2+}]}$$

$$\Rightarrow E^\circ = 0.2905 + \frac{0.059}{2}\log\frac{0.1}{0.01} = 0.32 \text{ V}$$

$$\text{Also } E^\circ = \frac{0.059}{n}\log K$$

$$\Rightarrow \log K = \frac{2E^\circ}{0.059} = \frac{0.32}{0.0295}$$

$$\Rightarrow K = (10)^{0.32/0.0295}$$

8. (3)

We know,

$\text{Rate} = k[A]^n$

$$\text{i.e., } \frac{\text{mol/L}}{s} = k\left[\frac{\text{mol}}{L}\right]^n$$

$$\Rightarrow K = (\text{mol})^{(1-n)}L^{(n-1)}s^{-1}$$

9. (2)

The balanced redox reaction is :

$3MnO_4^- + 5FeC_2O_4 + 24H^+ \rightarrow 3Mn^{2+}$

$+5Fe^{3+} + 10CO_2 + 12H_2O$

$\because 5$ moles of FeC_2O_4 require 3 moles of $KMnO_4$

$\therefore 1$ mole of FeC_2O_4 will require $\frac{3}{5}$ mole of $KMnO_4$

10. (3)

The ground state energy of H -atom is $+13.6eV$.

For second excited state, $n = 2+1 = 3$

$$\therefore E_3(He^+) = -13.6 \times \frac{Z^2}{n^2}eV$$

$$\left[\because \text{ for } He^+, Z = 2\right]$$

$$= -13.6 \times \frac{2^2}{3^2}eV = -6.04eV$$

11. **(4)**

The reaction is represented as

$$CH_3CH=CHCH(CH_3)_2 \xrightarrow{H^+}$$

$$CH_3CH_2-\overset{\oplus}{C}H-\underset{\underset{CH_3}{|}}{CHCH_3} \xrightarrow{1,2-H\ shift}$$

2° carbocation

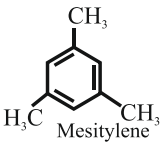
$$CH_3CH_2-CH_2-\overset{+}{C}\underset{\underset{CH_3}{|}}{CH_3} \xrightarrow{Br^-} CH_3CH_2-CH_2-\underset{\underset{CH_3}{|}}{\overset{\overset{Br}{|}}{C}}CH_3$$

3° carbocation

12. **(2)**

The reaction is represented as

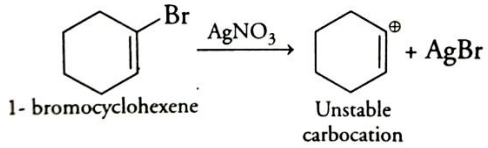
$$CH_3-CH=CHBr \xrightarrow[-HBr]{(i)NaNH_2} \underset{\underset{CH_3}{|}}{C\equiv CH} \xrightarrow[873K]{(ii)\text{Red hot iron tube}}$$



Mesitylene

13. **(3)**

Among the given options, compound given in option (c) i.e. 1-bromocyclohexene will not produce precipitate on reaction with $AgNO_3$.



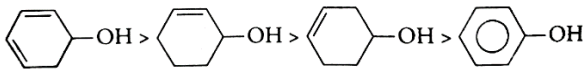
1- bromocyclohexene

Unstable carbocation

14. **(4)**

The correct order is (ii) > (iv)> (iii) > (i).

Dehydration of an alcohol in the presence of an acid involves the loss of -OH functional group as H_2O after protonation of -OH group and formation of carbocation. Its reactivity is directly proportional to the stability of the carbocation. So, according to stability of a carbocation the order of dehydration will be



15. **(3)**

The following steps are involved.

$$CH_3-CH=CH-CH_2-\underset{\underset{OH}{|}}{CH}-CH_3$$

$$\xrightarrow{PCC\downarrow}$$

$$CH_3-CH=CH-CH_2-\underset{\underset{O}{||}}{C}-CH_3$$

(A)

$$\xrightarrow[NaOI\downarrow]{}$$

$$CH_3-CH=CH-CH_2-COOH + CHI_3$$

(B)

$$\xrightarrow[NaOH+Cao\downarrow]{-CO_2}$$

$$CH_3-CH=CH-CH_3$$

(C)

But-2-ene

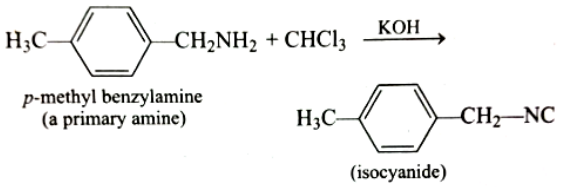
16. **(1)**

This problem can be solved by using the concept of effect of steric hindrance, hydration and H-bonding in basic strength of amines. Order of basic strength of aliphatic amine in aqueous solution is as follows (order of K_b)

$$(CH_3)_2\ddot{N}H > CH_3\ddot{N}H_2 > (CH_3)_3\ddot{N} > C_6H_5\ddot{N}H_2$$

As we know, $pK_b = -\log K_b$ So, $(CH_3)_2\ddot{N}H$ will have smallest pK_b value. In case of phenyl amine, N is attached to sp^2-hybridised carbon, hence it has highest pK_b and has least basic strength.

17. **(4)**



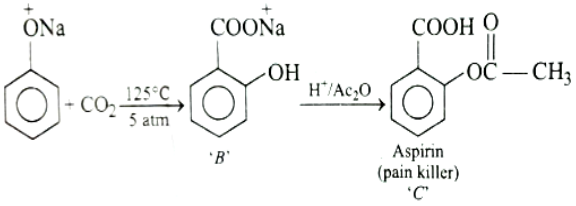
p-methyl benzylamine (a primary amine)

(isocyanide)

Carbylamine test is not given by secondary or tertiary amine

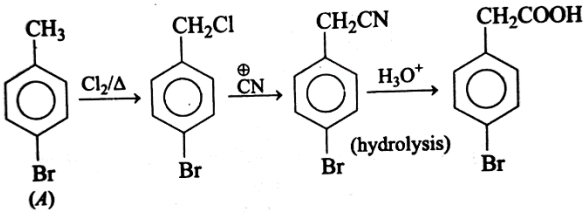
18. **(1)**

It is a Kolbe Schmidt reaction.



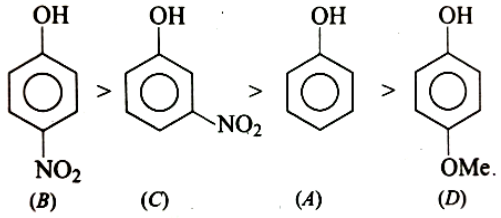
The second step of the reaction is an example of acetylation reaction.

19. **(3)**



20. **(4)**

Acidic strength $\propto$ Ka $\propto \frac{1}{pKa}$



pKa: B < C < A < D

21. **(1)**

Let oxidation state of Co is x. $[Co(NH_3)_5Cl]Cl_2$

$\therefore x + 0 - 1 = +2(NH_3 = \text{Neutral ligand})$

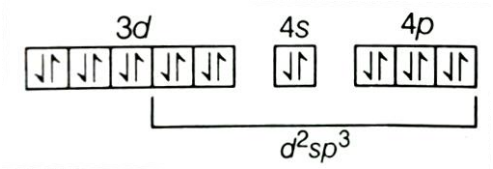
$x = +3$ (Primary valency)

$\therefore$ Coordination number of $Co = 6$ (Secondary valency)

Hence, primary valency is 3 and secondary valency is 6 .

22. **(2)**

$[Co(NH_3)_6]^{3+}$ is octahedral diamagnetic low spin complex. NH_3 is a strong field ligand cause larger splitting of d-orbital and pairing of electrons is favoured. Hence, $[CO(NH_2)_6]^{3+}$ is a low spin complex as well as diamagnetic. In $[CO(NH_3)_6]^{3+}$ Electronic configuration after complex formation is



Number of unpaired electrons $= 0$ Geometry of complex ion = Octahedral.

23. **(1)**

In $Cr(CO)_6$: $3d^6$, has no unpaired electrons, zero magnetic moment. As CO is a strong field ligand thus, pairing of electrons will take place.

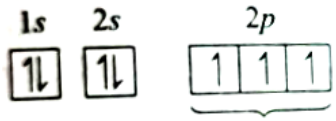
24. **(2)**

+5 +4 +3 +1

$H_3PO_4 > H_4P_2O_6 > H_3PO_3 > H_3PO_2$

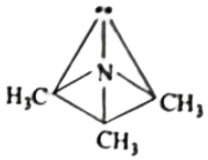
25. **(1)**

The correct statement is that $(SiH_3)_3$ N is planar and less basic than $(CH_3)_3$ N. The compounds trimethylamine $(CH_3)_3$ N and trisilylamine $(SiH_3)_3$ N have similar formulae, but have totally different structures. In trimethylamine the arrangement of electrons is as follows:

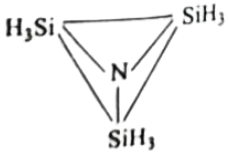


three bond pairs and one lone pair.

In trisilylamine, three sp^2 orbitals are used or σ-bonding, giving a trigonal planar structure.



$N(CH_3)_3$ molecule



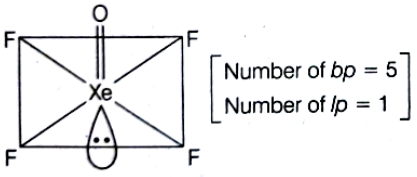
$N(SiH_3)_3$ molecule

26. **(2)**

According to Hardy Schulze rule, greater the charge on oppositely charged ion, greater is its coagulating power. Since arsenic sulphide is a negatively charged sol, thus, the order of coagulating power is $Na^+ < Ba^{2+} < Al^{3+}$.

27. **(1)**

In $XeOF_4$, Xe is sp^3d^2-hybridised. Geometry of the molecule is octahedral, but shape of the molecule is square pyramidal. According to VSEPR, theory it has one π bond. Remaining six electron pairs form an octahedron with one position occupied by a lone pair. Here, Xe contains one lone pair of electrons.



28. **(3)**

Among the given options Be^{2+} in has highest hydration enthalpy. It is because hydration enthalpy increases with decrease size of ions i.e. the smaller size of cation, more will be the hydration enthalpy of ion.

29. **(2)**

The ratio of number of atoms present in simple cubic, body centred cubic and face cantered cubic structure are 1 : 2 : 4 respectively.

30. **(2)**

Atomic mass of Cu = 63.5 u

$CuSO4 \rightarrow Cu^{2+} + SO_4^{2-}$

$Cu^{2+} + 2e^- \rightarrow Cu$

1 mol 2 mol 2F 1mol = 63.5g

SECTION – B

31. (1)

(X) $SO_3^{2-} + H_2SO_4 \rightarrow SO_2 \uparrow + H_2O + SO_4^{2-}$

SO_2 is a colourless gas with irritating odour.

(Y) $3SO_2 + K_2Cr_2O_7 + H_2SO_4 \rightarrow K_2SO_4$

$+Cr_2(SO_4)_3 + H_2O$

Green solution

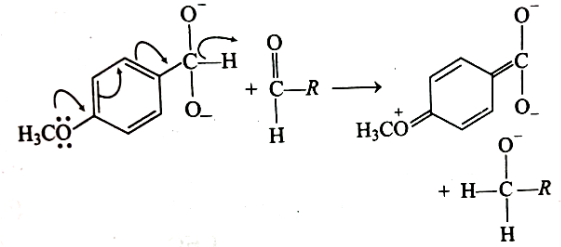
32. (4)

'S' stand for styrene. Buna-S is polymer of Buta-1, 3-diene and styrene.

$+(Ph\text{-}CH{=}CH_2) \xrightarrow{\text{Polymerisation}}$ Buna -S

33. (4)

Dioxoanion is better hydride donor. Electron donating group at ortho/para position further promote H^- transfer.



34. (4)

$MX : K_{sp} = S^2 = 4\times10^{-8}$

$\Rightarrow S = 2\times10^{-4}$

$MX_2 : K_{sp} = 4S^3 = 3.2\times10^{-14}$

$\Rightarrow S = 2\times10^{-5}$

$M_3X : K_{sp} = 27S^4 = 2.7\times10^{-15}$

$\Rightarrow S = 10^{-4}$

More is K_{sp} higher is the solubility. Order of solubility is

$MX > M_3X > MX_2$

35. (2)

Given equation

(A) $2CO(g) + O_2(g) \rightarrow 2CO_2(g)$,

$\Delta H_1^\theta = -x$ kJ mol^{-1}

(B) C (graphite) $+O_2(g) \rightarrow CO_2(g)$,

$\Delta H_2^\theta = -y$ kJ mol^{-1}

We have to find ΔH^θ for the reaction,

C (graphite) $+\frac{1}{2}O_2(g) \rightarrow CO(g) \ldots$ (i)

$CO_2(g) \rightarrow CO(g) + \frac{1}{2}O_2(g)$

$\Delta H_1 = \frac{x}{2}$ kJ / mole

C (graphite) $+O_2(g) \rightarrow CO_2(g) \ldots (iii)$

$\Delta H_2 = -y$ kJ / mol^{-1}

Eq. (i) = Eq. (ii) + Eq. (iii)

$\Delta H = \frac{x}{2} - y \Rightarrow \Delta H = \frac{x-2y}{2}$

SECTION – C

36. (1,2,4)

In acetic acid, methyl group in present which exerts +I effect and thus increases negative charge on carboxylate ion and destabilise it. The loss of proton becomes comparatively difficult in comparison to formic acid. Hence, acetic acid is weaker acid than formic acid. Whereas (1), (2), (4) shows hydrogen bonding for their phenomena.

37. (2,4)

Isotone have same number of neutrons $_{32}Ge^{76}$, $_{33}As^{77}$ and $_{34}Se^{78}$ have same number(44) of neutrons, hence they are isotones.

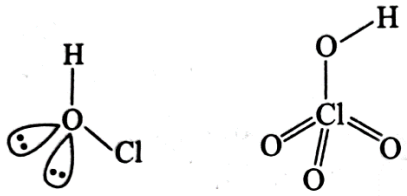
38. (1,2)

In option(1) $(4\pi+2)\pi$ electrons are present but the rings are non conjugated. Option(b) is $4n\ \pi$ electron system so (1) and (2) are non-benzenoid compounds.

39. (1,3,4)

The structure of HClO and $HClO_4$ are as follows.

The central atom in both HClO and $HClO_4$ is sp^3



Reaction of Cl_2 with H_2O gives HOCl which decomposed to give reagent oxygen.

$Cl_2 + H_2O \rightarrow [HCl + HOCl]$

$\rightarrow 2HCl + [O]$

The conjugate base of $HClO_4$ is weaker base than H_2O

$HClO_4$ is more acidic than HClO because of resonance stabilisation of its anion.

40. **(3, 4)**

$\left(C_6H_5\overset{+}{N}H_3Cl^-\right) + AgNO_3 \rightarrow AgCl\downarrow$

Anilinium hydrochloride Precipitate. No such precipitate is formed with *p* -chloroaniline. Also, carbylamine test will not be given by anilinium hydrochloride but *p* -chloroaniline will give this test.