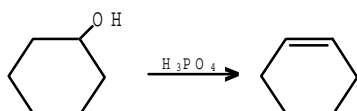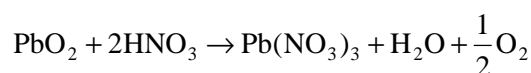1 Sol: **Ans. B**

D - glucopyranose is cyclic form of glucose. Around C - 1 (Newly formed chiral centre, due to cycle formation) two isomers are observed. They are called as α and β - anomers.
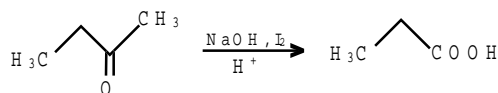
2 Sol: **Ans. A**

H_3PO_4 acts as dehydrating agent

3 Sol: **Ans. B**

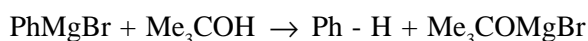$$PbO_2 + 2HNO_3 \rightarrow Pb(NO_3)_3 + H_2O + \frac{1}{2}O_2$$

4 Sol: **Ans. C**

Iodoform test.

5 Sol: **Ans. B**

$PhMgBr + Me_3COH \rightarrow Ph - H + Me_3COMgBr$

6 Sol: **Ans. B**

V^{4+} and Cu^{2+} both have one unpaired electron available.

7 Sol: **Ans. C**
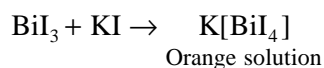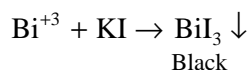
Work done against constant external pressure = $P_{ext} (V_2 - V_1)$

In adiabatic condition $\Delta q = 0$ therefore $w = \Delta u$

$$\therefore -P_{ext}(V_2 - V_1) = \frac{3}{2}R(T_2 - T_1) \text{ [Expansion work is negative]}$$

On solving, $T_2 = T_1 - \dfrac{2}{3 \times 0.0821}$.

8 Sol: **Ans. B**

$Bi^{+3} + KI \rightarrow BiI_3 \downarrow$
        Black

$BiI_3 + KI \rightarrow K[BiI_4]$
        Orange solution

9 Sol: **Ans. C**

Chalocopyrite ($CuFeS_2$)

Tvm Branch: T.C.No: 5/1703/30, Golf Links Road, H.B. Clony, Kowdiar Gardens, Trivandrum, ☎: **0471-2438271**
Kochi Branch: Bldg.No.41/352, Mulloth Ambady Lane, Chittoor Road, Kochi - 011, ☎: **0484 - 2370094,9388465944**
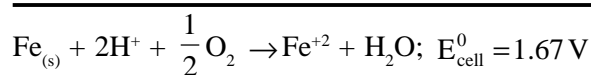
1

Note: Based on the memory

10 Sol: **Ans. D**

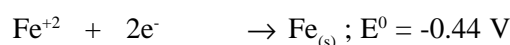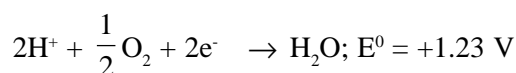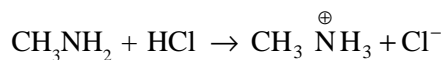It is an intramolecular Wurtz reaction.

11 Sol: **Ans. A**

S_N1 and S_N2, both reactions are possible due to aqueous acetone solution.

12. Sol: **Ans. B**

$$2H^+ + \frac{1}{2}O_2 + 2e^- \rightarrow H_2O; \ E^0 = +1.23 \text{ V}$$

$$Fe^{+2} + 2e^- \rightarrow Fe_{(s)}; \ E^0 = -0.44 \text{ V}$$

$$Fe_{(s)} + 2H^+ + \frac{1}{2}O_2 \rightarrow Fe^{+2} + H_2O; \ E^0_{cell} = 1.67 \text{ V}$$

$$\Delta G^0 = -nFE^0_{cell} = -2 \times 96.500 \times 1.67 = -322 \text{ kJ}$$

13. Sol: **Ans. B**

$$CH_3NH_2 + HCl \rightarrow CH_3 \overset{\oplus}{N}H_3 + Cl^-$$

Initially 0.1   0.08-

In solution   0.02   -   0.08

$$[OH^-] = K_b \frac{[CH_3NH_2]}{[CH_3NH_3^+]}$$

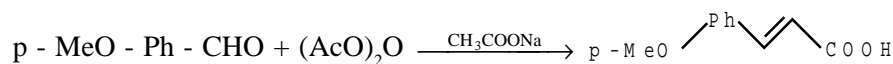$$[OH^-] = \frac{5 \times 10^{-4} \times 0.02}{0.08} = \frac{5}{4} \times 10^{-4}$$

$$[H^+] = \frac{K_W}{[OH^-]} = \frac{10^{-14} \times 4}{5 \times 10^{-4}} = 8 \times 10^{-11}$$

14 Sol: **Ans. A**

Number of radial nodes = n - l - 1,   so, for 3s: 3 - 0 - 1 = 2

For 2p: 2 - 1 - 1 = 0

15 Sol: **Ans. C**

p - MeO - Ph - CHO + (AcO)$_2$O $\xrightarrow{CH_3COONa}$ p - MeO $\diagup$ $\diagup\!\diagdown$ COOH
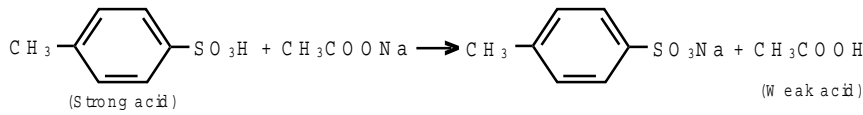
16 Sol: **Ans. D**

Order of reaction is determined experimentally. It may be fractional.

17 Sol: **Ans. C**

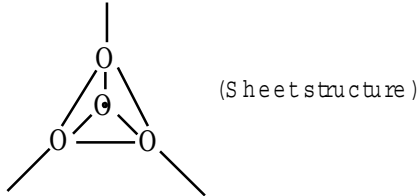$$\Delta T_b = i \times K_b \times m = 3 \times 0.52 \times \left(\frac{13.44}{134.4} \times \frac{1000}{1000} \right) = 0.16$$
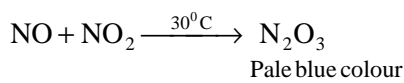
18 Sol: Ans. C

CH_3—⟨benzene⟩—SO_3H + CH_3COONa → CH_3—⟨benzene⟩—SO_3Na + CH_3COOH
(Strong acid)   (Weak acid)

Above reaction is acid base reaction.

19 Sol: Ans. A

(Sheet structure)

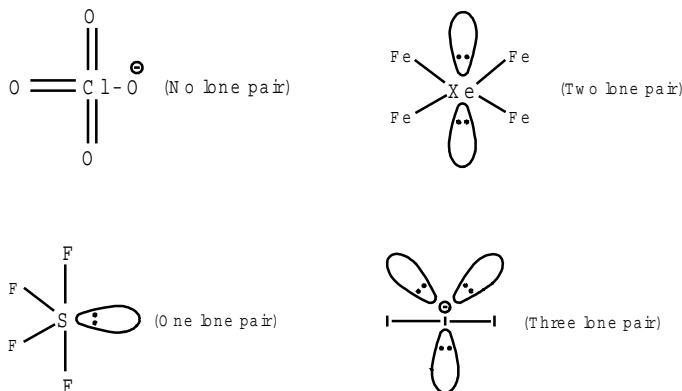**20 Sol. Ans. B**

$$NO + NO_2 \xrightarrow{30^0C} N_2O_3$$
Pale blue colour

21 Sol: Ans. A

$$\frac{r_{He}}{r_{CH_4}} = \sqrt{\frac{16}{4}} = 2:1$$

22 Sol: Ans. A

$[Co(NH_3)_4(Br)_2]Cl$ can show both Geometrical and Ionisation isomerism.

23 Sol: Ans. D

$O = Cl - O$ (No lone pair)

Xe with Fe ligands (Two lone pair)

S with F ligands (One lone pair)

(Three lone pair)

24 Sol: Ans. D

Lyophilic solutions are solvent loving in nature. Due to this property, such kind of solutions are self stabilised.

25 Sol: Ans. C

Point of difference is nature of carbanion 2^0 carbanions are less stable than 1^0 carbanions generally.

26 Sol: Ans. C

Due to layered structure in Black Phosphorous, it is most stable.

27 Sol: Ans. B

In ZnS, Anions (S^{-2}) are placed in fcc manner and cations (Zn^{+2}) are placed in alternate tetrahedral voids.

28 Sol: Ans. C

$KMnO_4$ can't be oxidised by any oxidising agents. Mn is in maximum possible oxidation state of VI.

Tvm Branch: T.C.No: 5/1703/30, Golf Links Road, H.B. Clony, Kowdiar Gardens, Trivandrum, ☎: **0471-2438271**
Kochi Branch: Bldg.No.41/352, Mulloth Ambady Lane, Chittoor Road, Kochi - 011, ☎: **0484 - 2370094,9388465944**

3

Note: Based on the memory