1. Predict if there will be any participation by mixing 20ml of 1.5 x 10^{-5} (M) $BaCl_2$ solution with 40ml of 0.9 x 10^{-5} (M) Na_2SO_4 solution (KsP of $BaSO_4$=1x 10^{10})

Or

Calculate the pH at which $Mg(OH)_2$ begins to precipitate from a solution containing 0.10(M) Mg^{2+} ions.[Ksp for $Mg(OH)_2$ = 1 x 10^{-11}].

2. Calculate the entropy change involved in the vapourization of water at 373K to vapour at the same temperature (Latent heat of vaporization=2.275kJ/g)

3, Write reactions of extraction of silver by cyanide process

4. Alkaline hydrolysis of tertiary butyl bromide follows rate equation
Rate= K[Alkyl (halide)]

a. Name the mechanism of the above reaction
b. Show the mechanism

5. (a) List the atoms with following electronic configuration in order of increasing ionisation energy

(i) He] $2p^6 3s^1$ (ii) He] $2p^5$ (iii) He] $2s^2\ 2p^6$

(b) What is the type of hybridisation in each carbon atom in the compound H_3C-C_= CH

6. Write a balanced equation for the following:

(i) Potassium iodide is treated with acidified $KMNO_4$ solution
(ii) Potassium dichromate(acidified) reacts with hydrogen sulphide
(iii) Acidified Potassium dichromate reacts with oxalic acid

7. (a) Carry out following conversions:

(i) Methane to ethene
(ii) 1 chloropropane to 2 chloropropane

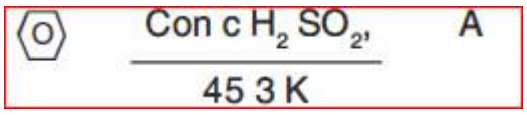
(b) Distinguish between the two (write a chemical list)

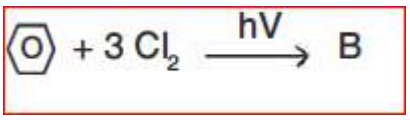
(i) But- I- yne and but-2-yne
(ii) Propene and Propyne

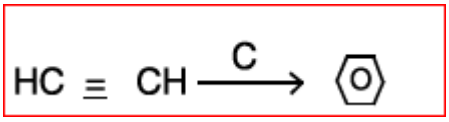
Or

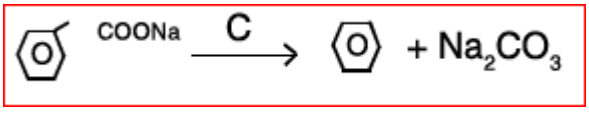
a. Write balanced equations for the following named reactions:
(i) Friddel-Craft acylation
(ii) Corey-house reaction
(iii) Clemmensen reduction

(b) Identify ABCD:

(I) 

(II) 

(III) 

(IV) 

8. (a) What is the molarity of a solution obtained by mixing 750ml of 0.5 M HCl with 250ml of 2(M) HCl?

(b) 2g of metal carbonate is neutralized completely by 100ml of 0.1 (N) HCl. What is the equivalent weight of metal carbonate?

9. 1.0 g of Mg is burnt in a closed vessel which contains 0.5g of O2. Which is the limiting reactant? What is the amount of MgO formed in the reaction?

2Mg + $O_2$2 MgO [Mg=24., O=16]

10. Give two reactions where hydrogen behaves as

(i) reducing agent (ii) oxidizing agent

11. (i) Write the bond line structure of the following compounds:

(a) 3, 4-dimethyl hept-2, 4 diene
(b) Cyclopentanol

(ii) Which alkaline has higher boiling point: n-hexane or isopentane and why?

12. **Match the following**:

(i) Nucleophiles	(a) Unsaturated hydrocarbons.
(ii) Plaster of Paris	(b) Electron deficient system.
(iii) Br2 + CCl4	(c) Lithium
(iv) Forms superoxides	(d) Electron rich system.
	(e) $CaSO_4$. ½ H2O
	(f) Potassium

13. Balance the following redox reaction by ion-electron method:

KMnO4 + FeSO4 + H2SO4 ——> Fe2 (SO4)3 + MnSO4 + K2SO4 + H2O (acidic medium)

Or

$I^- + MnO_4^- \longrightarrow I_2 + MnO_2$ (Basic Medium)

14. (i) A 100% pure sample of a divalent metal carbonate weighing 2g on complete thermal decomposition releases. 448 cc. of CO_2 at STP. What is the equivalent mass of the metal?

(ii) Draw the electron dot diagram of $HClO_4$.

OR

i) 0.115 g of a dibasic acid required 25 ml of N/10 NaOH solution for complete neutralisation. Calculate the molecular mass of the acid.

ii) Draw the electron dot diagram of PO_4^{-3} ion.

15. Draw the molecular orbital diagram of O_2. Find the bond order.

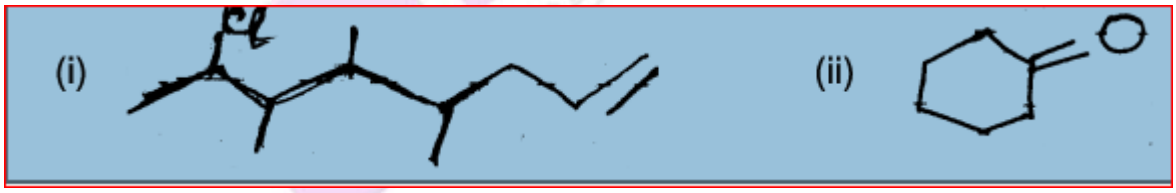
OR

Draw the molecular orbital diagram of N_2^+. Find the bond order.

16. Write the electronic configurations of the following ions:

a. Ca^{2+} (Ca=20) (b) Br^- (Br= 35)

17. Write the IUPAC names of the following compounds:



18. (a) Why do sodium catch fire when dropped in water?

(b) Name the following:

(i) Alkaline earth metal which is least reactive
(ii) Alkaline earth metal which forms strongest base
(iii) Alkali metal is liquid at temperatures above 30 C
(iv) Alkali metal which is the strongest reducing agent

19. (a) Write the electronic configuration of the Cr atom (Cr=24). How many unpaired electrons are there? What is it's magnetic behaviour?

(b) What will be the designation of the following orbitals?

i) n=3, l=0 , (ii) n=5, l=2

20. (i) Explain:

a) The relative strength of following acids is
Cl2CHOOH > ClCH2COOH>CH2COOH.

b) Methyl chloride is more reactive than chlorobenzene.

(ii) How will you prepare the following compounds:-

[Give reactions]
a) Ethane from acetaldehyde
b) Ethyne from iodoform (CHI3)
c) Ethene from ethanol.

OR

(i) Write two differences between inductive effect and electrometric effect.

(ii) Draw resonance structures of phenol.

(iii) Ozonolysis of an alkene X following by decomposition with water and a reducing agent gives ethanal and 3-pentanone. What is the structure of alkene X?