1. 25 ml of a solution containing Fe^{2+} on titration with a solution $K_2Cr_2O_7$ (having 0.49 g of the salt in 100 ml of the solution) in the usual way consumed 10 ml of the latter. How much $KMnO_4$ solution (having 0.316 g of the salt in 100 ml of the solution) will be consumed by 20 ml of the same solution of Fe^{2+} when titrated in the usual way with the $KMnO_4$ solution?

2. How much stoichemetric quantity of a solution of H_2SO_4 of acid strength 0.1 N will be needed to precipitate all the Ba^{2+} form a 100 ml of 0.01 M $BaCl_2$ solution?

3. A copper coulometer and a silver coulometer were connected in series. The copper coulometer contained a 5% solution of $CuSO_4$, $5H_2O$, while the silver coulometer contained 2% solution of $AgNO_3$. A current of 0.01 amp was passed through the coulometer for 30 minutes. What was the ratio of the weights of Cu and Ag deposited at the cathodes of the two coulometer respectively?

4. Write down the ground state electronic configurations of each one of the following elements (a) P (b) Ca (c) Cu (d) Cr (e) U

5. Define electron affinity and electron negativity. Are they related and if so how?

6. State and illustrate Le Chatelier's principle concerning chemical equilibrium.

7. Outline the general methods for extraction of metal from their sulphide ores, illustrating with Cu, Pb and Hg.

8. State giving equation what happens when

   (a) A solution $CuCl_2$ containing HCl is boiled with Cu burning.
   (b) Burning Mg metal is introduced into a jar filled with CO_2 gas.
   (c) $CaCO_3$ mixed with coke is heated to a high temperature.
   (d) A solution of alum is treated with NaOH solution till the precipitate initially formed is dissolved and the clear solution is boiled with the addition of excess NH_4Cl.
   (e) A solution containing $KClO_3$ and I_2 is boiled.

9. Outline the technical process of making motor spirit (gasoline) from crude petroleum.

10. Outline with equation the laboratory preparations of the following :
    (a) $CHCl_2$ (b) $C_2H_4Br_2$ (c) C_2H_2 (d) Nitrobenzene (e) Diethyl ether