

Question 1**[10]**

Compounds **C-A** and **C-B** are organic compounds. Carry out the following experiments and record the colour of the solution obtained, precipitate formed, and identify the gas evolved in the given table. Based on your observations and inferences, identify the functional group present in the compounds **C-A** and **C-B**.

a) Compound **C-A**

Test	Procedure	Observation	Inference
i.	Take 2 mL of given C-A in a clean test tube and add 2-3 drops of blue litmus solution or dip blue litmus paper in it.		
ii.	Take 2 mL of given C-A in a clean test tube, and add about 0.5 g sodium carbonate (Na_2CO_3).		
iii.	Take 2 mL of given C-A in a clean test tube, add 2 mL of ethyl alcohol and 1 mL of concentrated H_2SO_4 . Heat gently the solution mixture in water bath about 2-3 minutes. The mixture is cooled and poured into 20 mL of cold water taken in a beaker. (Show the result of this test to visiting examiner for verification)		

- iv. The chemical equation given below is the reaction taking place in **(Test ii)**. Complete and balance the chemical equation.

<p>..... + Na₂CO₃ → + H₂O + 2CH₃COONa</p>	
<p>v. Write the balanced chemical reaction in (Test iii).</p>	

b) Compound **C-B**

Test	Procedure	Observation	Inference
i.	Take 2 mL of given C-B in a clean test tube, and add about 0.5 g of sodium bisulphite (NaHSO_3) powder in it.		
ii.	Take 2 mL of given C-B in a clean test tube, and add 2-3 drops of Tollen's reagent in it. Heat the solution mixture gently in water bath for 2 to 3 minutes. (Show the result of this test to visiting examiner for verification)		
iii.	Take 2 mL of given C-B in a clean test tube, and add 2-3 drops of Schiff's reagent in it. (Show the result of this test to visiting examiner for verification)		

iv. Write the balanced chemical reaction in (**Test ii**).

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Question 2

[10]

You are provided with three solutions as follows:

- C-1** is a solution containing 0.8 g of potassium permanganate per 250 mL.
- C-2** is a solution containing 9.8 g of hydrated ammonium iron (II) sulphate (Mohr's Salt) per 250 mL.
- C-3** is a 1.0 M dilute sulphuric acid.

[Relative atomic masses: K=39, Mn=55, Fe=56, S=32, O=16, N=14, H=1]

The overall chemical reaction for the process is given as follows:



Follow the procedure given below to conduct the experiment:

- Rinse both the burette and the pipette with distilled water.
 - Rinse the burette with **C-1** (potassium permanganate) solution.
 - Rinse the pipette with **C-2** (hydrated ammonium iron (II) sulphate) solution.
 - Fill the burette with **C-1** solution.
 - Pipette 20 mL **OR** 25 mL of **C-2** solution into 250 mL conical flask.
 - Add 20 mL of **C-3** (dilute sulphuric acid) to C-2 taken in conical flask.
 - Titrate until a permanent light pink color appears in the conical flask.
 - Repeat steps from 4 to 7 at least three times to obtain concordant readings.
- a) Fill in the observation table as per the experiment.
- Show one of the **end points** with light pink colour in the conical flask to the visiting examiner.
 - Show one of the **titre values of the Concordant reading** to visiting examiner.

SI.No.	Volume of ammonium ferrous sulphate solution (mL)	Burette reading		Volume of KMnO ₄ solution consumed (mL)
		Initial	Final	
1				
2				
3				
Concordant value intended to use in calculation =				

- b) Based on the titration you have completed above, answer the following questions:
- i. Write down the balanced ionic equation involved in the redox titration you have performed.

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- ii. Identify the oxidizing and reducing agents from the above ionic equation.

Oxidizing agent:	
Reducing agent:	

- c) Calculate the following for C-1 (potassium permanganate):

- i. Strength in g/L

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ii. Percentage of purity

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d) Calculate the molecular mass of C-2 (hydrated ammonium iron (II) sulphate) and find out the molarity with appropriate unit.

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Rough Work

