Duration: $2^{1/2}$ Hour   **Max Marks: 60**

N.B: 1. All question carry equal marks.
       2. Figures to the right indicate full marks.
       3. Use of non-programmable calculator is allowed.

Q.1   **A.**   **Attempt any <u>TWO</u> of the following:**   **08**

     i.   Explain the types of ion exchange process for effluent treatment.

     ii.   Define effluent water and write the acceptable limits of any four parameters of it.

     iii.   Explain determination of phosphorous in effluent water.

     iv.   Describe multiple cathode method of electrodeposition.

     B.   **Attempt any <u>ONE</u> of the following**:   **04**

     i.   Write a note on Trickling filter process.

     ii.   Describe the process of solvent extraction in effluent treatment

Q.2   **A.**   **Attempt any <u>TWO</u> of the following:**   **08**

     i.   Explain the term solid waste. Discuss in detail the classification of it.

     ii.   Discuss the importance of separation of dry and wet waste.

     iii.   How non-decomposable solid waste are managed.

     iv.   Explain the methods of disposal of Biomedical waste.

     B.   **Attempt any <u>ONE</u> of the following:**   **04**

     i.   What is Dry Cake? Explain its importance in waste management.

     ii.   What are the direct and indirect effects of solid waste generated?

Q.3   **A.**   **Attempt any <u>TWO</u> of the following:**   **08**

     i.   Give any one method for analysis of styrene based polymers.

     ii.   Discuss the determination of volatile matter in paints.

     iii.   What are the advantages of organosilicons based paints?

     iv.   Give role of binder and thinner in paints.

B.   **Attempt any <u>ONE</u> of the following**:   **04**

i.   Give sources of metallic impurities in plastics.

ii.   Explain the use of paints in preventing the corrosion of metals.

Q.4   **A.**   **Attempt any <u>TWO</u> of the following:**   **08**

i.   Explain in detail the magnetic separation and gravity separation method for dressing of ore.

ii.   Give composition of Bauxite. How Fe is determined in Bauxite?

iii.   Give composition of Gun metal. Write a brief note on determination of Cu in Gun metal.

iv.   What is zone refining? Explain in detail the factors affecting zone refining.

B   **Attempt any <u>ONE</u> of the following:**   **04**

i.   What is opening of ore? Explain wet method for opening of ore,

ii.   0.3 g of Magnelium alloy was opened by proper treatment and the diluted to 250 mL. From the above stock solution, 25 mL was used for analysis of Mg. The 25 mL of stock solution requires 4.5 mL of 0.1 M EDTA . Calculate the percentage of Mg in alloy. (Atomic weight of Mg = 24.32)

Q.5   **Attempt any <u>FOUR</u> of the following:**   **12**

a.   Explain the recyling of treated water.

b.   Describe the hazardous effect of effluent from the metallurgical industries.

c.   Explain the meaning of the term '3R' in solid waste management.

d.   Give the importance of management of solid waste.

e.   Discuss the different types of plastics.

f.   How binders in paint analysed?

g.   Write a short note on smelting process.

h.   How Al is estimated in bauxite ore?

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