(2½ Hours) [Total Marks :60

N.B. : (1) **All** questions are **compulsory.**
(2) Use of log table or non programmable **calculator** is permitted.

1. (a) Attempt any **two** of the following:— **8**
(1) How does metallurgical industry contribute in potable water pollution?
(2) Elaborate the sewage treatment method and its importance.
(3) What are various pollutants for sources of potable water? Give permissible limits for any two of them.
(4) Discuss various steps involved in processing of effluent water and its reuse.

1. (b) Attempt any **one** of the following:— **4**
(i) How is electrodeposition technique used for recovery of metal from industrial effluent?
(ii) Why is it mandatory for industries to have effluent treatment plants?

2. (a) Attempt any **two** of the following:— **8**
(1) Give the effects of solid waste on environment.
(2) Highlight the importance of treatment and disposal method of bio-medical waste.
(3) 'Non-decomposable solid waste needs special attention'. Explain.
(4) Explain any two methods of disposal of solid waste.

2. (b) Attempt any **one** of the following:— **4**
(1) How is sludge from industrial effluent separated and disposed?
(2) Explain the concept of 'Reuse & Recycling' of solid waste.

3. (a) Attempt any **two** of the following:— **8**
(1) Define 'binders' and explain the role of binders in paints. Describe method for their analysis.
(2) Give classification of plastics. What is meant by fractionation of plastics?
(3) What are impacts of plastic on environment?
(4) How are vinyl chloride based polymers analysed?

3. (b) Attempt any **one** of the following:— **4**
(1) Explain methods for determination of metallic impurities in plastic.
(2) Suggest methods for separation & analysis of inorganic pigments.

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4. (a) Attempt any **two** of the following:— 8

(1) What is alloying? Explain its need. What is 18 carat gold?

(2) Discuss the principle & method of analysis involved in estimation of iron in hematite.

(3) Write a note on— 'pollution due to metallurgical processes'

(4) 0.451 g of solder alloy was analysed for its lead content. After opening 0.451 g sample, it is diluted to 250 cm^3. 25.0 cm^3 of sample required 4.2 cm^3 of 0.02M EDTA. Calculate percentage of lead in the given sample. (Atomic weight of lead = 207.2)

4. (b) Attempt any **one** of the following:— 4

(1) How will you estimate carbon in steel?

(2) What is zone refining? Discuss the parameters which affect the efficiency of zone refining.

5. Attempt any **four** of the following:— 12

(1) Give an account of electrodialysis with respect to recovery of metal from effluent.

(2) Explain the term 'sewage'. How is it classified?

(3) What is solid waste management? State its objectives.

(4) What is bio-medical waste? How does it contribute to pollution?

(5) Write a note on 'Role of organsilicones in paints'.

(6) How are additives in plastic determined?

(7) Explain :— Froth flotation method of metal dressing.

(8) How is thorium in monazite ore estimated?
