1. A. Attempt ANY TWO of the following:-(08)
   i) With the help of flow chart explain activated sludge process for sewage treatment.
   ii) How are metals recovered from effluent using ion exchange method?
   iii) What are the objectives of Common Effluent Treatment plant?
   iv) Why is it necessary to recycle and reuse treated water from effluent?

B. Discuss the Industrial effluent treatment process with the help of suitable flow chart. (04)
   OR
B. What are the Permissible limits for heavy metals in the metallurgical industrial effluent? (04)

2. A. Attempt ANY TWO of the following: (08)
   i) Discuss the 3R concept of solid waste management.
   ii) How is non decomposable solid waste managed?
   iii) Give the classification of Biomedical waste.
   iv) How does the solid waste generated affect civil life?

B. Discuss the treatment and disposal of dry cake. (04)
   OR
B. Explain the methods of disposal of Biomedical waste. (04)

3. A. Attempt ANY TWO of the following: (08)
   i) Discuss the inorganic pigments used in the paints.
   ii) Give the method for the analysis of styrene based polymers.
   iii) Give the classification of plastic.
   iv) What are the properties and applications of Organo silicones?

B. What is the impact of plastic on human life and environment as pollutant? (04)
   OR
B. Explain the role of binders in the paint. How are they analysed? (04)

4. A. Attempt ANY TWO of the following: (08)
   i) Give composition of Cupronickel and Bronze. How is copper estimated from cupronickel?
   ii) Write note on the zone refining as a purification technique.
   iii) How is Lead determined from Galena?
   iv) 0.510 gm of bronze was opened with proper treatment and then diluted to 250 cm$^3$. From this stock, 25 cm$^3$ of diluted solution was titrated against 0.09N Na$_2$S$_2$O$_3$ for the estimation of copper iodometrically. If the constant burette reading was 4.5 cm$^3$, then calculate the percentage of copper in the bronze. (Atomic weight of Copper = 63.5).
B. What is Ore dressing? Explain any one physical method of ore dressing in (04) metallurgical industry.

OR

B. What are the applications of high purity materials? (04)

5. Attempt ANY FOUR of the following: (12)
   i) Discuss effluent parameters required for the metallurgical industry.
   ii) Explain the importance of equalization tank in the effluent treatment process.
   iii) Write a note on the disposal of municipal solid wastes.
   iv) What are environmental health impacts of biomedical waste?
   v) Discuss the determination of volatile matter in the paints.
   vi) What are the metallic impurities present in the plastic? What are the methods of their determination?
   vii) How is Aluminium determined from Bauxite ore?
   viii) Explain pollution effect on environment due to metallurgical industry.