

(3 Hours)

Total Marks: 75

- N. B. (1) All questions are compulsory.
 (2) Use of log tables or non-programmable calculator is permitted.
- Q.1. Attempt any **Five** of the following 15
- Explain the physical and chemical parameters determining the water quality.
 - Distinguish between primary and secondary air pollutants.
 - Why is microwave oven used for chemical synthesis?
 - Explain the need of environmental audit.
 - What is alloying? Give the significance of it.
 - Justify - "zone refining an effective method for the purification of solids".
 - Discuss classification of pesticides.
 - What are different parameters used for expressing detergent quality?
- Q. 2. (a) What are the sources of CO as air pollutant? Discuss the basic principle involved in determination of CO in air sample by NDIR spectroscopy. 5
- OR**
- What is "BOD" and "COD" of effluent? How can they be correlated? 5
 - What is solid waste management? Give its important. 5
- OR**
- Explain the importance of equalization tank in effluent treatment. Discuss the steps included in primary treatment of the effluent. 5
 - 250 cm³ of water sample required 11.2 cm³ and 3.3 cm³ of 0.011M EDTA before and after the treatment respectively with an ion exchange resin for removal of hardness. Calculate the hardness removed by the resin in terms of ppm of CaCO₃. (At wt Ca = 40, C=12, O= 16) 5
- Q. 3. (a) Discuss the sources of thermal pollution? How it affects marine life? 5
- OR**
- How the bacteriological quality of potable water is determined? 5
 - What is hard water? How is the hardness of water determined? 5
- OR**
- Explain in brief the primary and secondary treatment of effluent. 5
 - Acetamide is produced by the reaction of acetylchloride with ammonia and also Can be obtained by thermal degradation of ammonium acetate. Compare the atom efficiency of these two processes. 5
- Q. 4. (a) Attempt any **Two** of the following 10
- Discuss the analysis of pyrolusite ore with special reference to estimation of Fe.
 - What is the need of the proper sampling in case of economically important ores?

- (iii) Distinguish between vacuum fusion and vacuum extraction. Give applications of any one of them.
- (iv) How will you analyze manganese in stainless steel using volumetric method?

(b) A sample of brass was found to contain 1.92% of lead and 43.7% of copper. **5**
556 mg of brass sample was dissolved and the resulting solution was diluted to 250 cm³, of this 50 cm³ solution was electrolyzed with platinum electrodes. Calculate the amount of lead dioxide formed at anode and the amount of copper deposited on the cathode. (At wt Cu = 63.5, Pb = 208, O = 16)

- Q.5. Attempt any **Three** of the following **15**
- (a) What are the different types of paints? How are the volatile and the non volatile components of the paints separated and analyzed?
 - (b) How can the GC be used to determine the monomer in polymers?
 - (c) How are organochlorine pesticides present in the sample determined?
 - (d) Explain pyrolysis GC with its applications in analysis of polymers with suitable example.
 - (e) Explain the following term with respect to petroleum products:
 - i) Doctor test
 - ii) Flash point
 - iii) Fire point
