

22362

12425

03 Hours / 70 Marks

Seat No.

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- Instructions* – (1) All Questions are *Compulsory*.
- (2) Answer each next main Question on a new page.
- (3) Illustrate your answers with neat sketches wherever necessary.
- (4) Figures to the right indicate full marks.
- (5) Assume suitable data, if necessary.
- (6) Use of Non-programmable Electronic Pocket Calculator is permissible.
- (7) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

**Marks**

1. **Attempt any FIVE of the following :** **10**
- a) Enlist the units used for expressing hardness of water.
- b) Define the terms 'BOD' and 'COD'.
- c) Give one example each of oil and fat and give its application.
- d) Write the reaction involved in the manufacturing of soaps.
- e) Enlist the objective of volumetric method of analysis.
- f) Give two examples of coordinate compounds.
- g) Explain in brief, the Werner's co-ordination theory.

P.T.O.

- 2. Attempt any THREE of the following :** **12**
- a) Elaborate the impact of different water impurities on wet processing of textiles.
  - b) Analyse the :
    - i) Moisture content of boiler fuel,
    - ii) Saponification value of given oil.
  - c) Elaborate two chemical properties of :
    - i) Ammonium sulphate
    - ii) Hydrogen sulphite and write their chemical structure.
  - d) Differentiate between qualitative and quantitative method of analysis. Give one example each.
- 3. Attempt any THREE of the following :** **12**
- a) Elaborate the reasons for the formation of –
    - i) scales
    - ii) sludge in boilers
  - b) Describe the use of sodium hydroxide in wet processing of cotton and polyester.
  - c) Describe the procedure for determining the Iodine value of oils.
  - d) Illustrate the significance of primary standards and secondary standards with suitable examples.
  - e) Explain the factors affecting the stability of a coordination compounds with suitable example.

**4. Attempt any THREE of the following :****12**

- a) Analyse the significance of total dissolved solids and total suspended solids present in water from processing point of view.
- b) A given fuel sample contains C = 67%, H – 6%, O – 30%, S – 0.4%, N – 0.3% and Ash – 0.3%.  
Calculate the Higher calorific value and Lower calorific value of fuel.
- c) In titration of NaOH and H<sub>2</sub>SO<sub>4</sub>, which chemical will be taken in burette and which indicator is used. Also find out the equivalent weights of NaOH and H<sub>2</sub>SO<sub>4</sub>.
- d) Correlate the significance of Iodine value and hydrogenation value of oil in predicting the chemical properties of oil
- e) Relate two uses of following chemicals in textile applications.
  - i) Sodium sulphate
  - ii) Hydrogen peroxide

**5. Attempt any TWO of the following :****12**

- a) Demonstrate the classification of fuels based on their physical state with two suitable examples each.
- b) Set-up a water treatment process using RO method with help of suitable sketch.
- c) Suggest the procedure involved in the determination of purity of :
  - i) Hydrogen peroxide
  - ii) Sodium hydrosulphite

**6. Attempt any TWO of the following :****12**

- a) You are provided with three different samples of wetting agents from three suppliers. Analyse the parameter which will be evaluated for selecting only one suppliers from the available three. Assume suitable data if required.
  - b) Find out the concentration of sulphuric acid in terms of normality, Molarity gpl and % w/v for the given values - 10 ml 0.1 N NaOH neutralisers 15 ml of sulphuric acid. Also mention the indicator used and colour change observed at end point.
  - c) Demonstrate the procedure for determining the purity of EDTA using any titration method. Also identify the applications of EDTA. Draw the chemical structure of EDTA and find out the molecular weight of the same.
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