

Note: This question paper contains two parts A and B. Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART - A

(25 Marks)

- 1.a) Write the specifications of potable water. [2]
 b) What is Caustic embrittlement? Give chemical reaction involved. [3]
 c) What are secondary cells? Give two examples. [2]
 d) What is single electrode potential? Write Nernst equation to calculate electrode potential. [3]
 e) Give the characteristics of Elastomers. [2]
 f) Write short note on free radical addition polymerisation. [3]
 g) Explain the importance of Octane number. [2]
 h) What is CNG? Give its composition and characteristic properties. [3]
 i) Define flash and fire point of a lubricant. [2]
 j) What are special cements? Give their uses. [3]

PART-B

(50 Marks)

- 2.a) Explain the Break point chlorination and give its significance. [5+5]
 b) A Sample of water showed the following analysis
 $CaCl_2 = 2.22\text{mg/l}$; $Mg(NO_3)_2 = 1.48\text{mg/l}$; $KCl = 7.45\text{mg/l}$; $CaSO_4 = 1.36\text{mg/l}$;
 $Mg(HCO_3)_2 = 2.92\text{mg/l}$; *Organic impurities* = 1.22mg/l .
 Calculate the temporary and permanent hardness of the given water sample. [5+5]
 OR
 3.a) Differentiate between chlorination and ozonization disinfection methods of potable water. [5+5]
 b) Explain the steps involved in treatment of sewage water. [5+5]
 4.a) What are fuel cells? Explain the construction and working of hydrogen oxygen fuel cell. [5+5]
 b) What do you understand by electrochemical series? Explain its applications. [5+5]
 OR
 5.a) Explain the construction, working and application of glass electrode with neat diagram. [5+5]
 b) Explain the chemical reactions of lead battery during its charging and discharging. [5+5]

6.a) Differentiate between thermoplastics and thermosetting plastics with suitable examples. [5+5]

7.a) What are Fiber reinforced plastics? Give their applications. [5+5]

8.a) Explain the proximate method of analysis of coal and write its significance. [5+5]

9.a) What is HCV and LCV of a fuel? Explain their inter relationship. [5+5]

10.a) What are composites? Give the classification and applications of composite materials. [5+5]

11.a) What is a refractory? Give their characteristic properties and applications. [5+5]

OR

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OR

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