CMR ENGINEERING COLLEGE: : HYDERABAD
UGC AUTONOMOUS
I–B.TECH–II–Semester End Examinations (Supply) - January- 2025
ENGINEERING CHEMISTRY
(Common for CSC, CSD, CSM, IT)

[Time: 3 Hours]   [Max. Marks: 60]

Note: This question paper contains two parts A and B.
  Part A is compulsory which carries 10 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   (10 Marks)

1. a) Which salts caused to temporary and permanent hardness?   [1M]
   b) Outline the significance of coagulation.   [1M]
   c) Identify the advantages of gaseous fuel over liquid fuel?   [1M]
   d) What is meant by octane number of gasoline?   [1M]
   e) Apply Nernst's equation for $Zn/Zn^{+2}//Cu/Cu^{+2}$ [1M]
   f) Explain reference electrode.   [1M]
   g) The rate of metallic corrosion increases with increase in temperature. Explain.   [1M]
   h) Explain why iron pipe does not rust when connected to zinc metal.   [1M]
   i) Interpret degree of polymerization.   [1M]
   j) Predict the formula of isoprene unit.   [1M]

PART-B   (50 Marks)

2. a) Evaluate the temporary and permanent hardness of water containing the following   [6M]
      salts $Ca(HCO_3)=16.2mg/l$, $Mg(HCO_3)=14.6mg/l$, $MgSO_4=12.0mg/l$ and
      $CaSO_4=13.6mg/l$.
   b) Discuss potable water treatment.   [4M]

OR

3. a) Apply ion exchange process to obtain deionized water.   [6M]
   b) Illustrate reverse osmosis by a neat sketch.   [4M]

4. a) Apply Dulong's formula to solve HCV and LCV for a sample of coal containing   [6M]
      carbon=84%, hydrogen=8%, sulphur =2% oxygen=2% and remaining is ash.
   b) Summarize the significance of proximate and ultimate analysis.   [4M]

OR

5. a) Discuss about the fractional distillation of petroleum.   [6M]
   b) How synthetic petrol is prepared by Fischer tropsch's process.   [4M]

6. Explain the measurement of pH of a solution using glass electrode. Mention the   [10M]
   advantages of this electrode.

OR

7. a) Explain about Lithium-ion battery with its applications.   [6M]
   b) Write a short note on solar cells.   [4M]

8. Outline what is corrosion and how can it be prevented? Explain various factors   [10M]
   influencing the rate of corrosion.

OR

9. a) Construct and describe the process of galvanization of iron.   [6M]
   b) Explain important parameters involved in electroplating.   [4M]

10.a) What is natural rubber? Explain vulcanization of rubber. [6M]

  b) Define Biodegradable polymer. Make a note on synthesis & applications of polyvinyl [4M]
  acetate.

OR

11.a) What are conducting polymers? How are they classified? Write application of [6M]
  conducting polymers.

  b) List out various applications of smart materials. [4M]

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