CODE: 17CA51101

B. Tech I Year I Semester (R17) Supplementary Examinations, February 2018

ENGINEERING CHEMISTRY

(Common to ECE & ME)

Time: 3 hours   Max Marks: 70

PART – A

1. Answer any **ten** questions (10 x 2 = 20 Marks)

   (a) Name the buffer used in the determination of hardness by EDTA method. Why pH 10 is maintained?
   (b) Define COD.
   (c) Give reason: polyacetylene is a conducting polymer whereas Bakelite is an insulator.
   (d) Write any two applications of Teflon.
   (e) A copper rod dipped in 0.05 M copper sulphate solution at 298 K. calculate the electrode potential of copper. E^0 of copper is +0.34 V.
   (f) What is sacrificial anode? Give example.
   (g) Name the fuel with 100 octane number and zero cetane number.
   (h) What is a lubricant? Give example.
   (i) Define fullerenes. Mention any one application.
   (j) What are refractories?
   (k) What is brackish water? Name any one method of demineralization of brackish water.
   (l) Why lithium is preferred as anode material in lithium batteries?

PART - B
Answer all five units (5 x 10 = 50 Marks)

UNIT-I

2. Explain the principle of estimation of Hardness by EDTA method.

OR

3. a) Write a note on caustic embrittlement.
   b) Describe Ion-exchange process for the purification of water.

UNIT-II

4. a) Explain the free radical mechanism of addition polymerization.

   b) What are conducting polymers? Explain the mechanism of conduction in polyacetyline.

OR

5. a) Mention the monomers used in the following polymers: i) Teflon ii) Bakelite iii) Nylon.

   b) Explain the synthesis and applications of polyurethane.

UNIT-III

6. a) Write the anode, cathode, electrolyte and discharge reactions of Ni-Cd battery.
   b) Write the cell reactions, cell representation and calculate the e.m.f of the cell, when the iron rod is immersed in 1.0×10^{-2} M $FeSO_4$ and Ag rod in 0.1×10^{-2}M AgSO4 solution. E^0 values of iron and silver electrodes are -0.44 V and $+0.80$ V respectively.

OR

7. a) Explain electrochemical theory of corrosion.
   b) Distinguish between electroplating and electroless plating.

UNIT-IV

8. a) What are fuels? Explain the classification of fuels with examples.
   b) Describe the Junker's method for the determination of calorific value of gaseous fuel.

OR

9. a) Define the following terms: i) flash point ii) fire point iii) cloud point.
   b) What is reforming? Write any four reforming reactions.

UNIT-V

10. What are nano materials? Mention the properties and applications of nano materials.

OR

11. Describe wet process of Portland cement manufacture.

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