

CODE: 17CA51101

B. Tech I Year I Semester Regular Examinations, December 2017

ENGINEERING CHEMISTRY

(Common to ECE & ME)

Time: 3 hours

Max Marks: 70

PART – A

1. Answer any **ten** questions (10 x 2 = 20 Marks)
- Name the oxidizing agent and indicator used in COD experiment.
 - Define BOD.
 - What is polymerization? Why all simple molecules do not produce polymers?
 - Define vulcanization of rubber.
 - A metal rod dipped in 0.05 M metal salt solution at 298 K gave a potential of 0.28 V. calculate the vacancy of metal. E^0 of metal is +0.34 V.
 - What is concentration cell corrosion?
 - Give one example for artificial solid and liquid fuel.
 - Define calorific value.
 - Write any two applications of CNT's.
 - What are ceramics?
 - Differentiate between scale and sludge.
 - Give reason: aqueous electrolyte is not used in lithium batteries.

PART - B

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

UNIT-I

2. 100 ml of hard water sample required 18 ml of 0.02 M EDTA salt solution using EBT as indicator. 7.5 ml of same EDTA salt solution was used for 100 ml of same water after removing the temporary hardness. Calculate the total and permanent hardness in terms of CaCO_3 equivalents.

OR

3. a) Write a note on colloidal and phosphate conditioning of water.
b) Describe Reverse osmosis process for the purification of water .

UNIT-II

4. a) Write the differences between thermo and thermosetting plastics.
b) Write the synthesis and applications of Buna-S.

OR

5. a) Mention the monomers used in the following polymers: i) Teflon ii) Bakelite iii) Nylon.
b) What are conducting polymers? Write the structure and applications of polyaniline.

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UNIT-III

6. a) Describe the construction and discharge reactions of H_2-O_2 fuel cell.
b) Explain electroplating of copper.

OR

7. a) Name and explain the type of corrosion, if Mg metal blocks are used to protect the corrosion in buried oil storage iron tanks.
b) Write the cell reactions and calculate the e.m.f of the following cell: $Fe/Fe^{2+} // 2Ag^+/2Ag$. When the iron rod is immersed in 1.0 M $FeSO_4$ and Ag rod in 0.1M $AgSO_4$ solution. E^0 values of iron and silver electrodes are -0.44 V and $+0.80$ V respectively

UNIT-IV

8. a) Write a note on octane number.
b) Describe the Junker's method for the determination of calorific value of gaseous fuel.

OR

9. a) What are lubricants? Explain any two properties.
b) Write a brief note on extreme pressure lubrication.

UNIT-V

10. What are refractories? Mention the properties and applications of refractories.

OR

11. What is Portland cement? Describe the wet process of Portland cement manufacture.
