

**CODE: 17CA51101**

B. Tech I Year II Semester (R17) Regular Examinations, May/June - 2018

**ENGINEERING CHEMISTRY**

(Common to EEE & CSE)

Time: 3 hours

Max Marks: 70

**PART – A**

1. Answer any **TEN** questions (10 x 2 = 20 Marks)
- Define buffer solution. Give an example.
  - Expand EDTA and write its structure.
  - Give an example of addition and condensation polymer.
  - Write any two applications of inorganic polymers.
  - A metal rod dipped in 0.02 M metal salt solution at 298 K gave a potential of 0.32 V. calculate the vacancy of metal.  $E^\circ$  of metal is +0.34 V.
  - What is sacrificial anode? Give an example.
  - Give reason: fuel with water content decreases its calorific value.
  - What is the composition of producer gas?
  - Write any two applications of fullerenes.
  - What are composite fibers? Give an example.
  - Give reason: aqueous electrolyte is not used in lithium batteries
  - Differentiate between scale and sludge.

**PART - B**

Answer all **FIVE** units (5 x 10 = 50 Marks)

**UNIT-I**

2. (a) 25ml of hard water sample required 18.6 ml of 0.03 M EDTA salt solution using EBT as indicator. 12.5 ml of same EDTA salt solution was used for 25 ml of same water after removing the temporary hardness. Calculate the total and permanent hardness in terms of  $\text{CaCO}_3$  equivalents.
- (b) Explain the determination of dissolved oxygen by Winklers method.

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 plastics and thermosetting plastics.
- (b) Write the synthesis and applications of polyurethanes.

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 polyacetylene.

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**UNIT-III**

6. (a) Describe the construction and discharge reactions of methanol-oxygen fuel cell.  
(b) Write the cell reactions and calculate the e.m.f of the following cell:  
 $Zn/Zn^{2+} // Cu^{2+}/Cu$ . Concentration of zinc and copper ions in solution are 0.02M and 0.05 M respectively. Given  $E^0$  values of Zinc and copper electrodes are  $-0.76$  V and  $+0.34$  V respectively.

OR

7. (a) Explain the type of corrosion protection applied, if Mg metal blocks are used to protect the corrosion in buried oil storage iron tanks.  
(b) Explain electroless plating of copper.

**UNIT-IV**

8. (a) Write a note on octane number and cetane 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) Define GCV and NCV. Why GCV is higher than NCV?

**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.

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