Code No: 131AG **R16**

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B.Tech I Year I Semester Examinations, December - 2016

ENGINEERING CHEMISTRY

(Common to EEE, ECE, CSE, EIE, IT)

Time: 3 hours **Max. Marks: 75**

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) What are the various units of hardness? Give the relation between them. [2]
b) List out the various steps involved in the sewage treatment. [3]
c) What is standard electrode potential? Give its units. [2]
d) Explain the functioning of the dry cell with chemical reactions. [3]
e) Define fibers and give two examples. [2]
f) Give the mechanism of free radical polymerization of Vinyl chloride. [3]
g) Give the classification of fuels with examples. [2]
h) Define HCV and LCV of a fuel and give their inter-relationship. [3]
i) What is meant by refractory? Give an example each for acidic and basic refractory. [2]
j) Define viscosity, Flash point and Pour point of a lubricant. [3]

PART-B

(50 Marks)

2.a) Define scales and sludges. What are the causes, effects and preventive method of these?
b) Estimate the amount of hardness of water by complexometric method. [5+5]

OR

3.a) Write a short note each on Calgon conditioning and Phospate conditioning of boiler feed water.
b) In the determination of hardness of water by complexometry, 20 ml of standard hard water containing 0.1 g of $CaCO_3$ per 100 ml consumed 15 ml of EDTA solution. 100 ml of hard water sample consumed 12 ml of EDTA solution. After boiling and filtering, the same water sample consumed 6 ml of EDTA solution. Calculate the temporary and permanent hardness of water. [5+5]

4.a) What is an electrochemical series? What are its applications?
b) What is meant my reference electrode? Give the construction and working of Calomel electrode. [5+5]

OR

5.a) Give the classification of batteries and describe the construction and working of Ni-Cd battery.
b) Define fuel cell. Write a short note on methanol-oxygen fuel cell. [5+5]

6.a) Differentiate thermo plastics from thermo set plastics with suitable examples.

b) Give the preparation, properties and applications of PVC. [5+5]

OR

7.a) Define elastomers. How Buna-S and butyl rubber are prepared? Give their applications.

b) What are bio degradable polymers? Write the advantages and applications of biodegradable polymers with suitable examples. [5+5]

8.a) What is cracking? How is gasoline obtained by moving bed catalytic cracking?

b) Write a short note each on Natural gas and LPG. [5+5]

OR

9.a) Calculate the LCV of fuel having 4% of hydrogen, whose gross calorific value is 8,828 K cal/kg.

b) How is coal analyzed by proximate analysis? Give its significance. [5+5]

10.a) What is Portland cement? Write the composition of white cement and water proof cement. What are their advantages?

b) Give the classification of lubricants with examples. Explain the significance of cloud point and pour point. [5+5]

OR

11.a) What are composites? Give the classification and advantages of composite materials.

b) Explain about Refractoriness under load, Porosity and Chemical inertness of a refractory. [5+5]

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