R16

Code No: 131AG

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B.Tech I Year I Semester Examinations, May/June - 2017

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 is hard water? What are the salts that cause hardness to water?	[2]
b)	How are the salts from sea water removed?	[3]
c)	Differentiate between primary and secondary cell.	[2]
d)	Write the Nernst equation and mention its importance?	[3]
e)	Write the structures of natural rubber and vulcanized rubber?	[2]
f)	Write a brief note on compounding of plastics.	[3]
g)	Define Cracking and knocking.	[2]
h)	How the volatile matter content in coal is determined?	[3]
i)	Define Refractory and Lubricant?	[2]
j)	Write the composition of Portland cement?	[3]

Part - B (50 Marks)

2.a) Explain about the ion exchange method of softening of water.

b) A sample of water contains following dissolved salts per liter.
$Ca(HCO_3)_2$=16.2mg, $Mg(HCO_3)_2$=14.6mg, $CaCl_2$=11.1mg and $MgSO_4$=12mg.
Calculate the total, permanent and temporary hardness of water? [5+5]

OR

3.a) What is disinfection of water? Explain the chlorination method.

b) Explain the steps involved in sewage treatment. [5+5]

4.a) Explain the construction and working of calomel electrode in the determination of pH of a solution

b) Calculate the EMF of the following cell.
$Zn/ZnSO_4//FeSO_4/Fe$
The standard electrode potentials of Zn^{+2}/Zn = - 0.76V and Fe^{+2}/Fe = 0.44V. [7+3]

OR

5.a) What is electrochemical series? Give its five applications.

b) Explain the construction and functioning of Nickel –Cadmium cell. [5+5]

6.a) Write the differences between thermoplastics and thermosetting plastics.

b) Give preparation, properties and engineering applications of Bakelite. [5+5]

OR

7.a) Write preparation, properties and engineering applications of i) Buna-S and ii) Thiokol rubber?

b) Explain the mechanism of conduction in conducting polymers with respect to transpolyacetylene? [5+5]

8.a) Explain the proximate analysis of coal and give its significance.

b) A coal sample has 80% of carbon, 9% of hydrogen, 6% of sulphur remaining is ash. Calculate the HCV and LCV of the coal sample? [5+5]

OR

9.a) What is Octane number and Cetane number? What is their significance?

b) Explain about moving bed catalytic cracking. [5+5]

10.a) Write a note on special cements.

b) What viscosity of lubricant? How is it determined? [5+5]

OR

11.a) What is Cloud point, Pour point, Flash point and Fire point of lubricants? Give their significance.

b) What are the characteristics of a good refractory? [6+4]

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