R15

Code No: 121AE

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B.Tech I Year Examinations, August - 2018

ENGINEERING CHEMISTRY

(Common to CE, EEE, ME, ECE, CSE, EIE, IT, MCT, AE, MIE, PTM, CEE)

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 Pilling-Bedworth rule?	[2]
b)	What is Electrochemical series?	[3]
c)	Explain why natural rubber need vulcanization.	[2]
d)	What is refractory and refractoriness?	[3]
e)	What is priming? How can it be prevented?	[2]
f)	What are the specifications of potable water?	[3]
g)	Give the classification of the fuels with suitable examples.	[2]
h)	Define gross and net calorific value and give their inter relationship.	[3]
i)	What is triple point?	[2]
j)	Derive an expression for Freundlich adsorption isotherm.	[3]

PART-B

(50 Marks)

2.a)	Give the mechanism of electrochemical corrosion of iron.	
b)	What is Concentration cell? Explain with an example.	[5+5]
	OR	
3.a)	Derive Nernst equation and explain its applications.	
b)	Discuss the various factors influencing the rate of corrosion.	[5+5]
4.a)	What are conducting polymers? Explain the conduction mechanism in polyacetylenes.	
b)	What is a lubricant? Give the characteristics of good lubricants.	[5+5]
	OR	
5.a)	How do you prepare nanomaterials by chemical vapour deposition method?	
b)	What are Biodegradable polymers? Explain their advantages.	[5+5]
6.a)	Explain the complexometric method of determination of the hardness of water.	
b)	What are Scales and sludges and explain their prevention methods?	[5+5]
	OR	

7.a) Calculate the amount of lime and soda required in kg for softening 10,000L of water containing following impurities.
$Ca(HCO_3)_2$=1.62mg/L, $CaSO_4$=0.34mg/L, NaCl=0.75mg/L, $MgCl_2$=0.95mg/L.

b) What is internal treatment of boiler water? Give an account on calgon conditioning. [5+5]

8.a) How is nitrogen determined in a solid fuel?

b) What is flue gas? How is it analysed by Orsats apparatus? [5+5]

OR

9.a) How the calorific value of a gaseous fuel is determined by Junker's gas calorimeter? Explain with a neat diagram.

b) Explain Proximate analysis of coal. How is it different from ultimate analysis? [5+5]

10.a) Describe the phase diagram of lead-silver system.

b) Discuss classification and optical properties of colloids. [5+5]

OR

11.a) What are the differences between physisorption and chemisorptions?

b) Explain the phase changes in water system with the help of phase diagram. [5+5]

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