Code No: 111AE **R13**

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B.Tech I Year Examinations, May/June - 2019
ENGINEERING CHEMISTRY
(Common to CE, EEE, ME, ECE, CSE, IT, AE, MIE, PTM, AGE)

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 the difference between chemical and electrochemical corrosion?	[2]
b)	Write anode and cathode reactions of Ni-Cd cell.	[3]
c)	What is a plastic? Give two examples.	[2]
d)	Give the applications of refractories.	[3]
e)	What is hardness of water? Give its units.	[2]
f)	What is Caustic embrittlement? What are its effects?	[3]
g)	What is CNG? Give its composition and uses.	[2]
h)	What are the advantages and disadvantages of solid fuels?	[3]
i)	Define Phase and degree of freedom of a system.	[2]
j)	Calculate the number of components in the following reaction $NH_4Cl_{(s)} \Leftrightarrow NH_{3(g)} + HCl_{(g)}$	[3]

PART-B

(50 Marks)

2.a)	Explain the construction and working principle of Quinhydrone electrode.	
b)	Explain the functioning of an electrochemical cell with example.	[5+5]
	OR	
3.a)	Describe electroless plating of Nickel.	
b)	What is Cathodic protection? Explain sacrificial anode method.	[5+5]
4.a)	Give the differences between thermoplastic and thermosetting resins with examples.	
b)	Write a note on conducting polymers.	[5+5]
	OR	
5.a)	What do you mean by setting and hardening of cement? Discuss the various steps involved with the help of chemical equations.	
b)	Explain about cloud point, pour point and flash point of a lubricant.	[5+5]
6.a)	Explain Zeolite process of softening water.	
b)	What is reverse osmosis? Explain. Give the advantages of reverse osmosis.	[5+5]
	OR	
7.a)	Write a note on Boiler corrosion.	
b)	Explain EDTA method of estimation of temporary and permanent hardness of water.	[5+5]

8.a) Give the criteria for selecting good fuel.
b) Explain ultimate analysis of coal and give its significance. [5+5]

OR

9.a) Explain the synthesis of petrol by Fischer Tropsch's process.
b) Explain the fixed bed catalytic cracking process with diagram. [5+5]

10.a) Explain phase diagram of water system.
b) Derive Langmuir adsorption isotherm. [5+5]

OR

11. Define the following terms:
a) Annealing b) Hardening c) Normalization d) Chemisorption e) Isotherm [10]

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