R13

Code No: 111AE

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech I Year Examinations, January/February - 2024
ENGINEERING CHEMISTRY
(Common to CE, EEE, ME, ECE, CSE, MIE, AGE)

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

Note: i) Question paper consists of Part A, Part B.
ii) Part A is compulsory, which carries 25 marks. In Part A, answer all questions.
iii) In Part B, Answer any one question from each unit. Each question carries 10 marks and may have a, b as sub questions.

PART - A

(25 Marks)

1.a)	What are Waterline and Pitting corrosion?	[2]
b)	Describe the Quinhydrone electrode and write its applications.	[3]
c)	Define Cloud and pour point. Give its significance.	[2]
d)	What is compounding of plastic? Explain the Injection molding method?	[3]
e)	Write the causes and preventive method for Caustic embrittlement.	[2]
f)	Explain the Reverse osmosis process of softening of sea water.	[3]
g)	Define calorific value. Write its different units.	[2]
h)	Briefly explain the Bergius process of synthesizing petrol.	[3]
i)	What are Micelles? Give examples.	[2]
j)	What is adsorption? Distinguish between physical and chemisorption.	[3]

PART - B

(50 Marks)

2.a)	Write the construction and working of Glass electrode. Write its application.	
b)	What is metallic coating? Discuss the process of Galvanizing and Tinning.	[5+5]
	OR	
3.a)	Write the construction, charging and discharging reactions of Lead-Acid battery	
b)	What is Electroless plating? Explain the Electroless plating of Nickel in detail.	[5+5]
4.a)	Write the synthesis, properties and applications of Bakelite and Dacron.	
b)	Write the chemical vapour deposition method of preparation of Nanoparticles.	[5+5]
	OR	
5.a)	What is Portland Cement? Write the composition.	
b)	What are Carbon Nanotubes? Mention its applications.	[5+5]
6.a)	What is Potable water? Write the Specifications and Steps involved in treatment of potable Water.	
b)	Distinguish between Zeolite process and ion –exchange water softening methods.	[5+5]
	OR	

7.a) Discuss the Lime soda process of softening of hard water along with the reactions involved.

b) A sample of water showed the following analysis $Mg(HCO_3)_2$ = 2.92 mg/l, $CaCl_2$= 4.44 mg/l, mg/l, $MgCl_2$ = 95 mg/l, and $CaSO_4$ = 1.36 mg/l. Calculate the Temporary and permanent hardness in the sample. [5+5]

8. Explain the analysis of Flue gases by Orsat's apparatus and write its significance. [10]

OR

9.a) What is Refining of Crude oil? What are the important fractions obtained from the Fractional distillation column?

b) Calculate gross and net calorific value of gaseous fuel from the following data obtained from calorimeter experiment. Volume of gaseous fuel burnt at STP is $0.1m^3$. Weight of the water used for cooling is 35kg. Temperature of the inlet water 26.0^0 C, temperature of outlet water is 40^0 C. weight of the water produced by steam condensation 0.03 kg, Latent heat of steam 587k.cal/kg. [5+5]

10.a) Differentiate between lyophilic and lyophobic colloids with examples.

b) Deduce the expression F+P=C+2 and explain the terms involved with suitable illustrations and the significance of the terms involved. [5+5]

OR

11.a) Discuss the salient features of phase diagram of Lead-silver system.

b) Briefly explain Langmuir's theory adsorption? Deduce an expression for Langmuir's Unimolecular adsorption isotherm.

c) Write short note on Tyndal effect. [4+3+3]

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