Code No: 181AJ **R22**

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech I Year I Semester Examinations, January/February - 2024
ENGINEERING CHEMISTRY
(Common to EEE, CSE, IT, CSIT, CE (SE), CSE (CS), CSE(DS), CSD)

Time: 3 Hours **Max. Marks: 60**

Note: This question paper contains two parts A and B.
i) **Part- A** for 10 marks, ii) **Part - B** for 50 marks.
- Part-A is a compulsory question which consists of ten sub-questions from all units carrying equal marks.
- Part-B consists of **ten questions** (numbered from 2 to 11) **carrying 10 marks each**. From each unit, there are two questions and the student should answer one of them. Hence, the student should answer five questions from Part-B.

PART- A

(10 Marks)

1.a)	What is temporary hardness? Give example.	[1]
b)	What is colloidal conditioning?	[1]
c)	What are secondary batteries? Give example.	[1]
d)	What is the cause of corrosion?	[1]
e)	Write the types of polymerization with examples.	[1]
f)	What is vulcanization?	[1]
g)	Write Dulong's formula.	[1]
h)	Write the composition of CNG.	[1]
i)	Define pour point.	[1]
j)	Write the applications of polyacryl amides.	[1]

PART - B

(50 Marks)

2.a)	100 ml of a sample of water required 25 ml of 0.01 M EDTA for the titration using Eriochrome Black-T indicator. Calculate total hardness of water.	
b)	Explain the desalination of water by Reverse Osmosis method.	[5+5]
	OR	
3.a)	Explain the determination of F^- ion by ion-selective electrode method.	
b)	Describe the steps involved in the treatment of potable water.	[5+5]
4.a)	Describe the construction of Lithium-ion battery and mention the chemical reactions involved during charging and discharging.	
b)	Describe the construction of a methanol-oxygen fuel cell and write its applications.	[5+5]
	OR	
5.a)	Explain the mechanism of rusting of iron in the presence of a neutral or slightly alkaline medium in the presence of oxygen with a neat diagram and chemical reactions.	
b)	What is the principle involved in cathodic protection? How can you protect the buried pipelines by impressed current method?	[5+5]

6.a) Write the differences between thermoplastic and thermosetting plastics with examples.
b) Write the preparation, properties and applications of Teflon, Butyl rubber and Bakelite. [5+5]

OR

7.a) Write the classification of conducting polymers with examples and mention their applications.
b) What are biodegradable polymers? Write the applications of polylactic acid. [5+5]

8.a) Explain the proximate analysis of coal and its significance.
b) Define calorific value, gross and net calorific value. What is the relation between gross and net calorific value. [5+5]

OR

9.a) Describe the manufacture of gasoline by Fischer-Tropsch's method.
b) Explain the process of fractional distillation of crude oil and mention various fractions in the order of their boiling ranges. [5+5]

10.a) Write the chemical composition of Portland cement and describe the functions of its ingredients.
b) Describe shape memory materials with examples and mention their applications. [5+5]

OR

11.a) Write the classification of lubricants with examples and mention the characteristics of good lubricants.
b) Describe the mechanism of thick film lubrication and mention the lubricants used in it. [5+5]

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