Code No: 181AJ **R22**

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech I Year I Semester Examinations, September - 2023

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)	Why hardness of water expressed in terms of $CaCo_3$ equivalents.	[1]
b)	How are exhausted ion exchange resin regenerated?	[1]
c)	What are the causes for corrosion?	[1]
d)	What is difference between primary and secondary batteries?	[1]
e)	Write any two applications of Bakelite.	[1]
f)	What is the importance of measuring fixed carbon in coal?	[1]
g)	Define HCV and LCV.	[1]
h)	Give examples of biodegradable polymers.	[1]
i)	What do mean by Cloud point.	[1]
j)	What is the composition of cement?	[1]

PART - B

(50 Marks)

2.a)	How can scale formation be prevented by Calgon conditioning? Explain it.	
b)	Mention advantages and disadvantages of ion exchange process of softening water over lime soda process.	[5+5]

OR

3.a)	How the hardness of water is determined by EDTA method and give its advantages?	
b)	How caustic embrittlement occurs and give the chemical reactions involved in it?	[5+5]
4.a)	Discuss the working of methanol-oxygen fuel cell.	
b)	Explain the nature of metal affecting the rate of corrosion.	[5+5]

OR

5.a)	Discuss lithium ion battery.	
b)	Differentiate (i) anodic and cathodic coatings (ii) electro and electroless plating.	[5+5]

6.a) Differentiate synthetic and natural rubber? Give the preparation and uses of two synthetic rubber

b) Describe p-type and n-type of conducting polymers. [5+5]

OR

7.a) Briefly discuss the preparation and properties of Bakelite.

b) State the importance of biodegradable polymers. [5+5]

8.a) Discuss the various methods involved during refining of petroleum.

b) Explain moving bed catalytic cracking with a labeled flow diagram. [5+5]

OR

9.a) Explain how moisture, volatile matter and ash can be determined and write their significance.

b) Discuss Natural gas and Bio-diesel. [5+5]

10.a) Discuss the manufacture of Portland cement.

b) Write the classification of refractories with examples. [5+5]

OR

11.a) Write a note on poly l-lactic acid.

b) Outline (i) cloud and pour point (ii) flash and firepoint. [5+5]

---ooOoo---