Roll No.												

PRESIDENCY UNIVERSITY

BENGALURU

Mid - Term Examinations – October 2025

Date: 09-10-2025 **Time:** 09.30am to 11.00am

School: SOE	**Program:** B. Tech.	
Course Code: CHE2505	**Course Name:** Materials Chemistry for Engineers	
Semester: I	**Max Marks**: 50	**Weightage:** 25 %

CO - Levels	**CO1**	**CO2**	**CO3**	**CO4**	**CO5**
Marks	**24**	**14**	**12**		

Instructions:

(i) Read all questions carefully and answer accordingly.

(ii) Do not write anything on the question paper other than roll number.

Part A

Answer ALL the Questions. Each question carries 2 marks. **5Q x 2M=10M**

1	Mention few impurities present of water.	**2 Marks**	**L1**	**CO1**
2	State two disadvantages of hard water.	**2 Marks**	**L1**	**CO1**
3	Define Fullerenes and mention its dimension.	**2 Marks**	**L1**	**CO2**
4	Mention two applications of Nanomaterials.	**2 Marks**	**L1**	**CO2**
5	Define Calorific value of a fuel.	**2 Marks**	**L1**	**CO3**

Part B

Answer the Questions. **Total Marks 40M**

6.	**a.**	Discuss various sources of water and explain potable/drinking water standards according to BIS or WHO.	**10 Marks**	**L2**	**CO 1**
		Or			
7.	**a.**	Describe the steps involved in the municipal water treatment process.	**10 Marks**	**L2**	**CO 1**

8.	**a.**	Explain in detail the various boiler troubles caused by hard water and their prevention methods.	**10 Marks**	**L2**	**CO 1**
		Or			
9.	**a.**	A water sample was analyzed and found to contain the following salts: $Mg(HCO_3)_2$: 36.5 ppm, $CaCl_2$: 55.5 ppm, $MgSO_4$: 30 ppm, $CaSO_4$: 40.8 ppm $Ca(HCO_3)_2$: 24.3 ppm. Calculate the Total Hardness, Temporary Hardness, and Permanent Hardness of the water sample. Express your answer in ppm, °French (°fr), and °Clarke (°Cl). (Given Atomic Weights: Ca:40; Mg: 24; H : 1; C : 12; O : 16; S : 32; Cl : 35.5)	**10 Marks**	**L3**	**CO 1**

10.	**a.**	Discuss the Top-down and Bottom-up approaches for the synthesis of nanomaterials, including advantages and disadvantages of each method.	**10 Marks**	**L2**	**CO 2**
		Or			
11.	**a.**	Explain the structure, types, properties and applications of carbon nanotubes (CNTs).	**10 Marks**	**L2**	**CO 2**

12.	**a.**	Discuss the classification of fuels and explain the key characteristics of good fuels.	**10 Marks**	**L2**	**CO 3**
		Or			
13.	**a.**	Explain the various components of a battery and classify different types of batteries with suitable examples.	**10 Marks**	**L2**	**CO 3**