Roll No.												

PRESIDENCY UNIVERSITY

BENGALURU

Mid - Term Examinations – October 2025

Date: 29-10-2025 **Time:** 11.00am to 12.30pm

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	State two standards for drinking water.	**2 Marks**	**L1**	**CO1**
2	Define temporary hardness of water.	**2 Marks**	**L1**	**CO1**
3	Define carbon nanotubes and mention its dimension.	**2 Marks**	**L1**	**CO2**
4	Define nanofiltration and mention one important application in water treatment.	**2 Marks**	**L1**	**CO2**
5	Give one example each of a solid, liquid, and gaseous fuel.	**2 Marks**	**L1**	**CO3**

Part B

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

6.	**a.**	Differentiate between Osmosis and Reverse Osmosis. Explain the process of Reverse Osmosis for desalination with a neat diagram.	**10 Marks**	**L2**	**CO 1**
		Or			
7.	**a.**	Explain the steps involved in the Sewage wastewater treatment process.	**10 Marks**	**L2**	**CO 1**

8.	**a.**	Discuss the boiler troubles caused by Sludge, Scale, Priming, and Foaming and mention their prevention methods.	**10 Marks**	**L2**	**CO 1**
		Or			
9.	**a.**	Calculate the Total hardness, Temporary hardness and Permanent hardness of a water sample containing the following: $CaCl_2$: 18 mg/L, $MgCl_2$: 42 mg/L, $CaSO_4$: 20.5 mg/L ; $Mg(HCO_3)_2$: 60 mg/L ; $Ca(HCO_3)_2$: 82 mg/L, $MgSO_4$: 15 mg/L ; Express the Hardness in ppm, degree French and degree Clarke. (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 importance of nanomaterials in electronics, medicine, energy, environment, consumer products, and space technology.	**10 Marks**	**L2**	**CO 2**
		Or			
11.	**a.**	Explain the structure, properties and applications of Graphene.	**10 Marks**	**L2**	**CO 2**

12.	**a.**	Discuss the characteristics of a good fuel and explain the construction of a bomb calorimeter with a labeled diagram.	**10 Marks**	**L2**	**CO 3**
		Or			
13.	**a.**	Define a battery and explain the main components of a battery with examples and its applications.	**10 Marks**	**L2**	**CO 3**