Roll No.												

PRESIDENCY UNIVERSITY

BENGALURU

End - Term Examinations – December 2025

Date: 17- 12- 2025 **Time:** 09:30am – 12:30pm

School: SOCSE	**Program:** B Tech	
Course Code : CHE2501	**Course Name:** Chemistry of Smart Materials	
Semester: I	**Max Marks**: 100	**Weightage**: 50%

CO - Levels	**CO1**	**CO2**	**CO3**	**CO4**	**CO5**
Marks	**14**	**14**	**14**	**32**	**26**

Instructions:

(i) Read all questions carefully and answer accordingly.

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

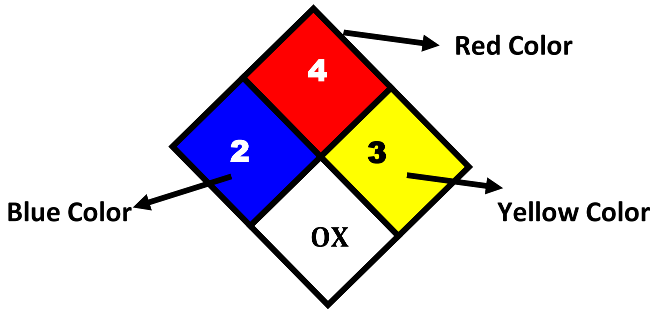
Part A

Answer ALL the Questions. Each question carries 2marks. **10Q x 2M=20M**

1.	Write the ball and stick model of acetone	**2 Marks**	**L1**	**CO1**
2.	Define Ionic bond with an example	**2 Marks**	**L1**	**CO1**
3.	Write four advantages of LED	**2 Marks**	**L2**	**CO2**
4.	What is liquid crystal?	**2 Marks**	**L2**	**CO2**
5.	Write any two applications of chemiresistor sensors.	**2 Marks**	**L2**	**CO3**
6.	Differentiate between active and passive RFID tags.	**2 Marks**	**L2**	**CO3**
7.	Mention any two effects of e-waste on human health.	**2 Marks**	**L3**	**CO4**
8.	Define supercapacitor and mention any two applications.	**2 Marks**	**L2**	**CO5**
9.	What is standard electrode potential?	**2 Marks**	**L2**	**CO5**
10.	State any two characteristics of lithium in lithium battery?	**2 Marks**	**L3**	**CO5**

Part B

Answer the Questions. **Total Marks 80M**

11.	**a.**	What is chemoinformatics? List out the applications of chemoinformatics.	**10 Marks**	**L2**	**CO1**
Or					
12.	**a.**	An MSDS label for a chemical is shown below. Discuss in detail the safety information indicated by the colors and numbers on the label 	**10 Marks**	**L2**	**CO1**

13.	**a.**	What are OLEDs? Mention the properties and applications of OLEDs.	**10 Marks**	**L2**	**CO2**
Or					
14.	**a.**	What are memory devices? Describe the classification of electronic memory devices, including the materials used, operating conditions, and suitable examples.	**10 Marks**	**L2**	**CO2**

15.	**a.**	Explain the construction, working of how Electrochemical sensors are used to detect VOCs with neat labelled diagram.	**10 Marks**	**L2**	**CO3**
Or					
16.	**a.**	List and explain the key requirements for the synthesis of CNTs using the modified CVD technique, and draw a schematic diagram of the process	**10 Marks**	**L2**	**CO3**

17.	**a.**	What are biocompatible polymers? Discuss synthesis of PHBV with along with relevant reaction mechanism. List two properties and applications of PHBV.	**10 Marks**	**L3**	**CO4**
Or					
18.	**a.**	Define E-waste. Explain the hydrometallurgical process used for extracting copper from PCBs. Discuss each step-in detail, providing balanced chemical equations and a clearly labelled schematic diagram.	**10 Marks**	**L3**	**CO4**

19.	**a.**	Explain the types of organic memory devices by taking p-type and n-type semiconductor molecules. List the five criteria for organic and polymeric semiconductor materials in memory systems.	**20 Marks**	**L3**	**CO4**
		Or			
20.	**a.**	Define Green Chemistry? List 12 principles of Green Chemistry and calculate the percentage of atom economy for the following chemical reaction: $CH_4 + 2O_2 \longrightarrow CO_2 + 2H_2O + \text{energy}$	**20 Marks**	**L3**	**CO4**

21.	**a.**	Explain the construction and working of a typical solar cell. Illustrate with a labelled diagram. Discuss the advantage and disadvantage along with any five applications.	**20 Marks**	**L4**	**CO5**
		Or			
22.	**a.**	Define batteries and discuss their classification with appropriate examples. Elaborate on the construction, operation, and applications of a lithium–manganese dioxide ($LiMnO_2$) battery.	**20 Marks**	**L4**	**CO5**