

USN

Course Code 1BCHE102/202

First/ Second Semester B.E. Degree Examinations, July 2026

APPLIED CHEMISTRY FOR CSE STREAM

(CSE, AIML, CSE-AI & CSE-DS)

Duration: 3 hrs

Max. Marks: 100

Note: 1. Answer any FIVE full questions choosing ONE Full Question from each Module
 2. Formula Handbook is permitted
 3. Missing data, if any, may be suitably assumed

<u>Q. No</u>	<u>Question</u>	<u>Marks</u>	<u>(RBT:CO: PI)</u>
<u>Module-1</u>			
1.	a. Explain the working principle and applications of Quantum dot Light Emitting Diodes (QLEDs).	06	(2 :1: 1.2.1)
	b. Specify the differences between organic and inorganic memory devices.	06	(2 :1: 1.2.1)
	c. What are organic semiconductors? Explicate the different types of organic semiconductors used in memory devices.	08	(3 :1: 1.2.1)
(OR)			
2.	a. Write a note on p-type semiconductor and n- type semiconductor.	06	(2 :1: 1.2.1)
	b. Describe the synthesis of TiO ₂ -RAM nanomaterial by sol-gel method.	06	(2 :1: 1.2.1)
	c. Classify the Liquid Crystals and explain any two.	08	(3 :1: 1.2.1)
<u>Module-2</u>			
3.	a. Explain the synthesis, properties and applications of PMMA.	06	(2 :2: 1.2.1)
	b. Describe the synthesis and applications of Cd-Se Quantum dots by wet chemical method.	06	(2 :2: 1.2.1)
	c. A polymer sample consisting of 2, 4, 6, 8 polymer chains of molecular weights of 1×10^5 , 3×10^5 , 5×10^5 , 7×10^5 respectively. Calculate number average and weight average molecular weight of the polymer.	08	(3 :2: 1.2.1)
(OR)			
4.	a. Describe the conduction mechanism of polyaniline.	06	(2 :2: 1.2.1)
	b. Describe the size dependent properties of the following: (i) Quantum confinement effect (ii) Surface-to-volume ratio (iii) Band gap	06	(2 :2: 1.2.1)
	c. Calculate number average and weight average molecular weight of a polymer sample consisting of 1, 2, 4, 5 polymer chains of molecular weights of 1000, 3000, 4000, 5000, respectively.	08	(3 :2: 1.2.1)
<u>Module-3</u>			
5.	a. Define fuel cell. List out the differences between fuel cell and battery.	06	(2 :3: 1.2.1)
	b. Discuss the production of green hydrogen by photocatalytic water splitting using TiO ₂ method.	06	(2 :3: 1.2.1)
	c. Define Concentration cells. The EMF of the following concentration cell at 298 K $\text{Ag(s)} / \text{AgCl (0.01M)} // \text{AgCl (X M)} / \text{Ag(s)}$ is 0.10 V. Write the electrode reaction, and calculate the value of X.	08	(3 :3: 1.2.1)

Note: (RBT: - Revised Bloom's Taxonomy Level: CO - Course Outcome: PI- Performance Indicator)

(OR)

- | | | | | |
|----|----|---|----|---------------|
| 6. | a. | Describe the construction, working principle and applications of solar photovoltaic cell (PV cell). | 06 | (2 :3: 1.2.1) |
| | b. | Explain the construction, working and applications of Li-Ion battery. | 06 | (2 :3: 1.2.1) |
| | c. | Define batteries. Classify the batteries based on their usage and give an example each. | 08 | (3 :3: 1.2.1) |

Module-4

- | | | | | |
|----|----|--|----|---------------|
| 7. | a. | Discuss the gas sensors for the detection of dissolved oxygen of water. | 06 | (2 :4: 1.2.1) |
| | b. | Explicate the process of anodization. | 06 | (2 :4: 1.2.1) |
| | c. | Calculate the CPR in both mpy and mmy for a thick steel sheet of area 550 inch ² which experiences a weight loss of 885 g after one year. The density of the steel sheet is 7.9 g/cm ³ . Given K for mpy and mmy is 534 and 87.6 respectively. | 08 | (3 :4: 1.2.1) |

(OR)

- | | | | | |
|----|----|---|----|---------------|
| 8. | a. | Explain the electrochemical theory of corrosion taking rusting of iron as an example. | 06 | (2 :4: 1.2.1) |
| | b. | Describe the working principle and applications of conductometric sensor. | 06 | (2 :4: 1.2.1) |
| | c. | Apply the differential aeration corrosion to explain the waterline and pitting corrosion. | 08 | (3 :4: 1.2.1) |

Module-5

- | | | | | |
|----|----|---|----|---------------|
| 9. | a. | Discuss the sources and composition of e-waste. | 06 | (2 :5: 1.2.1) |
| | b. | Explicate the properties and applications of green solvents for server heat management. | 06 | (2 :5: 1.2.1) |
| | c. | Explain the steps involved in the extraction of gold from e-waste. | 08 | (2 :5: 1.2.1) |

(OR)

- | | | | | |
|-----|----|---|----|---------------|
| 10. | a. | Explain the synthesis, properties and applications of polylactic Acid (PLA) | 06 | (2 :5: 1.2.1) |
| | b. | Elaborate the steps involved in the green synthesis of ZnO nanoparticles. | 06 | (2 :5: 1.2.1) |
| | c. | Describe the effect of e-waste on environment and human health. | 08 | (2 :5: 1.2.1) |

** ** *