Basavarajeswari Group of Institutions

2022 SCHEME

BALLARI INSTITUTE OF TECHNOLOGY & MANAGEMENT

(Autonomous Institute under Visvesvaraya Technological University, Belagavi)

USN										Course Code	2	2	C	H	E	S	12	/	22

First / Second Semester B.E. Degree Summer Semester Examinations, September / October 2025

CHEMISTRY FOR COMPUTER SCIENCE & ENGINEERING STREAM

Duration: 3 hrs **Max. Marks: 100**

Note: 1. Answer any* FIVE *full questions, choosing* ONE *full question from each module.
2. Use of Chemistry Formula Handbook is permitted.
3. Missing data, if any, may be suitably assumed.

Q. No		*Question*	*Marks*	*(RBTL:CO:PI)*
		Module-1		
1.	**a.**	Explain the working principle and applications of conductometric sensors.	**06**	**(2:1:1.2.1)**
	b.	Explain construction, working and applications of sodium ion battery.	**06**	**(2:1:1.2.1)**
	c.	Illustrate the working principle of sensors for the measurement of SO_X and NO_X.	**08**	**(3:1:1.2.1)**
		(OR)		
2.	**a.**	Explain working principle of sensors for the measurement of Dissolved Oxygen.	**06**	**(2:1:1.2.1)**
	b.	Explain the construction and working of lithium Ion battery.	**06**	**(2:1:1.2.1)**
	c.	What are fuel cells? Illustrate the construction, working and applications of methanol-oxygen fuel cell.	**08**	**(3:1:1.2.1)**
		Module-2		
3.	**a.**	Write a note on light emitting electrochemical cells.	**06**	**(2:2:1.2.1)**
	b.	Explain properties and application of Organic Light Emitting Diodes (OLED'S).	**06**	**(2:2:1.2.1)**
	c.	Give the classification of liquid crystals. Explain any two of them.	**08**	**(3:2:1.2.1)**
		(OR)		
4.	**a.**	Explain properties and application of Quantum Light Emitting Diodes (QLED'S).	**06**	**(2:2:1.2.1)**
	b.	Write a note on nanomaterials and organic materials used in optoelectronic devices.	**06**	**(2:2:1.2.1)**
	c.	Explain the classification of electronic memory devices.	**08**	**(3:2:1.2.1)**
		Module-3		
5.	**a.**	Explain electrochemical theory of corrosion taking rusting of iron as an example.	**06**	**(2:3:1.2.1)**
	b.	Define ion selective electrode. Explain construction and working of glass electrode.	**06**	**(2:3:1.2.1)**
	c.	Define Corrosion Penetration Rate (CPR). Calculate the CPR in both mpy and mm/yr for a metal block of area 150 $inch^2$ which experiences a weight loss of 845 g after a year. The density of the metal block is 7.9 g/cm^3. (Given: K values are 534 and 87.6 in mpy and mm/yr).	**08**	**(3:3:1.2.1)**

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

(OR)

6.	**a.**	Define reference electrode. Explain construction and working of calomel electrode.	**06**	**(2:3:1.2.1)**
	b.	Explain the waterline and pitting corrosion on the basis of differential aeration corrosion.	**06**	**(2:3:1.2.1)**
	c.	Calculate CPR in mmx an mpy for an iron sheet of area 150 square inches which undergoes a weight loss of 4.5 kg when exposed to corrosive environment for one year. The density of iron sheet is 7.9 g/cm^3. Given K values for mmy and mpy are 87.6 and 537 respectively.	**08**	**(3:3:1.2.1)**

Module-4

7.	**a.**	What are PV cells? Explain construction and working of photovoltaic cells.	**06**	**(2:4:1.2.1)**
	b.	Discuss preparation, properties and applications of Kevlar.	**06**	**(2:4:1.2.1)**
	c.	What are conducting polymers? Illustrate the synthesis and mechanism of conduction in Polyacetylene.	**08**	**(3:4:1.2.1)**

(OR)

8.	**a.**	Explain generation of hydrogen by electrolysis of water.	**06**	**(2:4:1.2.1)**
	b.	Give advantages and disadvantages of PV Cells.	**06**	**(2:4:1.2.1)**
	c.	Calculate number average and weight average molecular weight of the polymer sample consisting of 2, 3, 5 and 7 molecules having molecular weight 3×10^5, 4×10^5, 5×10^5 and 8×10^5 respectively.	**08**	**(3:4:1.2.1)**

Module-5

9.	**a.**	Write a note on sources, composition and characteristics of e-waste.	**06**	**(2:5:1.2.1)**
	b.	Explain recovery of gold from e-waste.	**06**	**(2:5:1.2.1)**
	c.	Illustrate the recycling and recovery of e-waste by hydrometallurgical extraction processes.	**08**	**(3:5:1.2.1)**

(OR)

10.	**a.**	Discuss health hazards due to exposure to e-waste.	**06**	**(2:5:1.2.1)**
	b.	Describe in brief the role of stake holders (any two) in environmental management of e-waste.	**06**	**(2:5:1.2.1)**
	c.	Illustrate the recycling and recovery of e-waste by thermal treatment methods.	**08**	**(3:5:1.2.1)**

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