MAKE-UP EXAM

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BCHES102/202

First/Second Semester B.E./B.Tech. Degree Examination, Nov./Dec. 2023
Applied Chemistry for CSE Stream

Time: 3 hrs. Max. Marks: 100

Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. VTU Formula Hand Book is permitted.
3. M : Marks , L: Bloom's level , C: Course outcomes.

		Module – 1	M	L	C
Q.1	a.	What is conductometric sensor? Explain its working principle and two applications.	07	L1	CO1
	b.	Define electrochemical sensor? Explain working principle of electrochemical sensors and its application?	07	L1	CO1
	c.	What is electrochemical gas sensors SO_x ? Explain electrode reactions and its application.	06	L1	CO1
		OR			
Q.2	a.	What is electrochemical gas sensors NO_x ? Explain in detail working principle and its application.	07	L1	CO1
	b.	Explain construction working and application of lithium-ion battery and its advantages and its application.	07	L2	CO1
	c.	What is disposable sensors? Explain in detail working principle in the detection of biomolecules with an example.	06	L1	CO1
		Module – 2			
Q.3	a.	Discuss in detail basic concepts of electronic memory classification.	07	L2	CO2
	b.	What are the types of organic / inorganic memory devices are used in computers with example?	07	L1	CO2
	c.	Write briefly about electronic memory device (i) Transistors (ii) Capacitors	06	L1	CO2
		OR			
Q.4	a.	What are liquid crystals display? Explain classification, properties and its application in liquid crystal display technique.	07	L1	CO2
	b.	Explain the properties and applications of organic light emitting diode in details.	07	L2	CO2
	c.	Discuss the properties and application of Quantum light emitting diodes in detail.	06	L2	CO2
		Module – 3			
Q.5	a.	Define metallic corrosion. Explain the electrochemical theory of corrosion taking iron as example.	07	L1	CO3
	b.	Define anoding. Explain the process of anoding of aluminium with electrode reaction and its application.	07	L1	CO3
	c.	A steel of area 100 $inch^2$ is exposed to air near the seashore. After 1 year it was found that the steel sheet has lost 485 g due to corrosion. What is the value of CPR in mpy and in mmpy? Can such steel sheet applicable for the construction purpose where the steel sheet is exposed? (Given area A = 100 $inch^2$, total weight lost W = 485 g, T = 1 year, D = 7.9 g/cm^3 , K = 87.6 mmpy)	06	L3	CO3

		OR			
Q.6	**a.**	What are reference electrodes? Explain the construction, working and application of calomel electrode.	**07**	**L1**	**CO3**
	b.	Explain theory, instrumentation of potentiometric estimation of ferrous ammonium sulphate and its applications?	**07**	**L2**	**CO3**
	c.	A concentration cell is constructed by dipping copper rods in 0.001 M and 0.1 M copper sulphate solutions. Calculate EMF of cell at 298 K.	**06**	**L3**	**CO3**
		Module – 4			
Q.7	**a.**	Define conducting polymers? Explain synthesis and conducting mechanism of polyacetylene and its application.	**07**	**L1**	**CO4**
	b.	Explain the synthesis, properties and commercial applications of Kevlar.	**07**	**L2**	**CO4**
	c.	A polymer has the following composition 100 molecular mass 1000g/mol, 200 molecules of molecular mass 2000g/mol and 500 molecules of molecular mass 5000g/mol. Calculate the number and weight average, molecular weight.	**06**	**L3**	**CO4**
		OR			
Q.8	**a.**	Define PV Cell. Explain construction working with diagram and its advantages and applications.	**07**	**L1**	**CO4**
	b.	Explain generation of energy (green hydrogen) by electrolysis of water splitting and its applications.	**07**	**L2**	**CO4**
	c.	Explain any four advantages and disadvantages of hydrogen production sustainability.	**06**	**L2**	**CO4**
		Module – 5			
Q.9	**a.**	What is E-waste? Mention the source of E-waste and explain the need for e-waste management.	**07**	**L1**	**CO5**
	b.	Explain thermal treatment and pyrometallurgical methods of direct recycling from E-waste.	**07**	**L2**	**CO5**
	c.	Explain the five ill effects of toxic materials used in manufacturing electrical and electronic E-waste in details.	**06**	**L2**	**CO5**
		OR			
Q.10	**a.**	Explain the extraction of Gold from E-waste in detail steps involved.	**07**	**L2**	**CO5**
	b.	Explain hydrometallurgical extraction methods involved in extraction from E-waste.	**07**	**L2**	**CO5**
	c.	Write brief note on role of stakeholder for example producer, consumer, recycler and statutory bodies.	**06**	**L1**	**CO5**

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