CBCS SCHEME

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BCHEE102/202

First/Second Semester B.E/B.Tech. Degree Examination, June/July 2024

Chemistry for EEE Stream

Time: 3 hrs. Max. Marks:100

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

			M	L	C
		Module – 1			
1	a.	Explain classification of materials as conductors, insulators and semiconductors with the help of band theory.	**7**	**L2**	**CO1**
	b.	Explain the preparation, properties and commercial applications for grapheme oxide.	**7**	**L2**	**CO1**
	c.	Describe the purification of electronic grade silicon from quartz by float zone method.	**6**	**L2**	**CO1**
		OR			
2	a.	What are conducting polymers? Explain the mechanism of conduction in polyethylene.	**7**	**L2**	**CO1**
	b.	What is electroless plating? Describe the electroless plating of copper in the manufacture of double-sided PCB.	**7**	**L2**	**CO1**
	c.	A polymer has the following composition 100 molecules of molecular mass 1000 g/mol, 200 molecules of molecular mass 2000g/mol, and 500 molecules of molecular mass 5000g/mol. Calculate the number and weight average molecular weight.	**6**	**L3**	**CO1**
		Module – 2			
3	a.	What are Batteries? Explain the classification of batteries with suitable examples.	**6**	**L2**	**CO2**
	b.	Explain the construction and working of sodium-ion battery. Mention its applications.	**7**	**L2**	**CO2**
	c.	Explain the construction and working of vanadium flow battery. Mention its applications.	**7**	**L2**	**CO2**
		OR			
4	a.	What are photovoltaic cells? Describe the construction and working of a PV cell. Mention its advantages and disadvantages.	**7**	**L2**	**CO2**
	b.	What are fuel cells? Explain the construction and working of methanol – oxygen fuel cell.	**6**	**L2**	**CO2**
	c.	Explain the construction and working of lithium – polymer battery. Mention its application.	**7**	**L2**	**CO2**
		Module – 3			
5	a.	Define corrosion? Explain the electro chemical theory of corrosion taking iron as an example.	**7**	**L2**	**CO3**
	b.	Explain the differentiate metal differential aeration corrosion with an example.	**7**	**L2**	**CO3**
	c.	Calculate the CPR in both MPY and MMPY for a thick steel sheet of area 100 $inch^2$ which experience a weight loss of 485g after one year. (Density of steel = $7.9 g/cm^3$).	**6**	**L3**	**CO3**

		OR			
6	a.	What is anodizing? Explain anodizing of aluminium. Mention its application.	**7**	**L2**	**CO3**
	b.	Write a note on : i) Galvanizing ii) Sacrificial anode method.	**7**	**L2**	**CO3**
	c.	What is e-waste? Describe the effects of e-waste on environment and human health.	**6**	**L2**	**CO3**
		Module – 4			
7	a.	Describe the synthesis of nano-materials by sol-gel method with example.	**7**	**L2**	**CO4**
	b.	Write a note on nanofibers and nanosensors.	**7**	**L2**	**CO4**
	c.	What are QLED? Mention its properties along with their applications.	**6**	**L2**	**CO4**
		OR			
8	a.	Describe the synthesis of nano-materials by co-precipitation method with an example.	**7**	**L2**	**CO4**
	b.	What are nano-materials? Explain any two size dependent properties of nano-materials.	**7**	**L2**	**CO4**
	c.	What are OLED's? Mention its properties and applications.	**6**	**L2**	**CO4**
		Module – 5			
9	a.	What are reference electrodes? Explain the construction and working of calomel electrode.	**7**	**L2**	**CO3**
	b.	Explain the working principle and applications of conductometric sensor.	**7**	**L3**	**CO3**
	c.	What are concentration cells? A concentration cell is constructed by immersing two iron electrodes in 0.01m and 0.1m Fe SO_4 solution represent the cell and calculate EMF of the cell at 298K.	**6**	**L3**	**CO3**
		OR			
10	a.	What are ion-selective electrodes? Explain the construction and working principle of glass electrode.	**7**	**L2**	**CO5**
	b.	Explain the working principle and applications of colorimetric sensor.	**7**	**L3**	**CO5**
	c.	Explain how the P^H of the given solution is determined using glass electrode.	**6**	**L2**	**CO5**

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