USN | | | | | | | | | |

BCHEE102/202

First/Second Semester B.E./B.Tech. Degree Supplementary 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. VTU Formula Hand Book is permitted.
      3. M : Marks , L: Bloom's level , C: Course outcomes.

		Module – 1	M	L	C
Q.1	a.	Explain purification of electronic grade si using quartz by float zone method.	07	L2	CO1
	b.	Describe electroless plating of cu in the manufacture of PCB.	07	L2	CO1
	c.	Define : (i) Conducting polymers (ii) Number average molecular weight (iii) Weight average molecular weight	06	L2	CO1
		OR			
Q.2	a.	Explain classification of materials as conductors, semiconductors and insulators using band theory.	07	L2	CO1
	b.	Explain synthesis, properties and applications of graphene oxide.	06	L2	CO1
	c.	In a polymer sample, 20% of molecules have molecular mass 15000 g/mol, 45% molecules have molecular mass 25000 g/mol, remaining molecules have molecular mass 27000 g/mol. Calculate number average mol.wt ($\overline{M_n}$) and weight average molecular weight ($\overline{M_w}$).	07	L3	CO1
		Module – 2			
Q.3	a.	Explain construction and working of Na-ion battery and mention its application.	07	L2	CO2
	b.	What are fuel cells? Explain construction and working of Methonol – O_2 fuel cell.	07	L2	CO2
	c.	Explain construction and working of PV cells.	06	L2	CO2
		OR			
Q.4	a.	What are batteries? Explain classification of batteries with examples.	07	L2	CO2
	b.	Explain the construction and working of Lithium-polymer battery. Mention its applications.	07	L2	CO2
	c.	Explain construction and working of polymer electrolyte membrane fuel cell.	06	L2	CO2
		Module – 3			
Q.5	a.	Define corrosion. Explain electrochemical theory of corrosion taking Fe as example.	07	L2	CO3
	b.	Explain the process of galvanization with applications.	07	L2	CO3
	c.	Explain sacrificial anodic method of prevention of corrosion.	06	L2	CO3
		OR			
Q.6	a.	What is Anodising? Explain Anodising of Al.	07	L2	CO3
	b.	What is e-waste? Explain the methods of e-waste disposal.	06	L2	CO3
	c.	A sheet of carbon steel meter wide by three meters long has lost 40g to corrosion over the past six months. Calculate corrosion penetration rate (cpr) in mpy and mmpy. (carbon steel density = 7.8 g/cc, K = 87.6 mmpy, K = 534 mpy)	07	L3	CO3

		Module – 4			
Q.7	**a.**	What are Nano materials? Explain any two size dependent properties of nano materials.	07	L2	CO4
	b.	Explain synthesis of nano materials by sol gel method.	06	L2	CO4
	c.	What are liquid crystals? Explain the properties and applications of OLED and QLED.	07	L2	CO4
		OR			
Q.8	**a.**	What are pervoskite materials? Give the properties and applications of pervoskite materials.	07	L1	CO4
	b.	Write a note on nanofibres and nano sensors.	06	L1	CO4
	c.	Explain the classification of liquid crystals. Mention their application.	07	L2	CO4
		Module – 5			
Q.9	**a.**	What are reference electrodes? Explain construction and working of calomel electrode.	07	L2	CO5
	b.	Explain the process of determination of p^H of Vinegar using glass electrode.	06	L2	CO5
	c.	Represent a cell formed by immersing two silver electrodes in $AgNO_3$ solution of concentration 0.01 and 0.1 M. Write the reactions and find the emf of the cell.	07	L3	CO5
		OR			
Q.10	**a.**	Explain principle, instrumentation and application of potentiometric sensors in estimation of iron.	07	L3	CO5
	b.	Explain how the strength of a weak acid is determined using a conductometric sensor.	07	L2	CO5
	c.	Explain how cu is estimated using colorimeter.	06	L3	CO5

* * * * *