

OR

Q.6	a.	Identify and explain the type of corrosion taking place in the following cases: i) Bolt and nut made up of different metals in contact with each other. ii) Water stored in Iron tank.	6	L2	CO3
	b.	Describe galvanizing and mention its applications.	7	L2	CO3
	c.	What is corrosion penetration rate? A thick brass sheet of area 400 inch is exposed to moist air, after a period of two years, it was found to experience a weight loss of 375g due to corrosion. Given density of brass is 8.73g/cm ³ . Calculate: i) CPR in mpy ii) CPR in mmp year.	7	L3	CO3

Module – 4

Q.7	a.	What are nano-materials? Explain any two size dependent properties of nanomaterials.	7	L2	CO4
	b.	Describe the synthesis of nano materials by sol-gel process. Mention its advantages.	6	L2	CO4
	c.	What are liquid crystals? Write the properties and applications of i) OLED's ii) QLED's.	7	L1	CO4

OR

Q.8	a.	Write a note on nano fibers and nano sensors.	6	L1	CO4
	b.	What are Perovskite materials? Give the properties and applications of Perovskite materials in upto electronic devices.	7	L2	CO4
	c.	What are LCD's Give the properties and applications of i) Twisted nematic LCD's ii) In plane switching LCD's.	7	L2	CO4

Module – 5

Q.9	a.	What are ion-selective electrodes? Explain how p ^H of the given solution is determined using glass electrode.	6	L2	CO5
	b.	What are reference electrodes? Describe the construction and working of calomel electrode. Mention its applications.	7	L2	CO5
	c.	Explain the working principle and instrumentation of electro-chemical sensors. Mention the applications of electrochemical sensors.	7	L3	CO5

OR

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Q.10	a.	What are concentration cells? Represent the cell format by the coupling of two copper electrodes immersed in copper sulphate solutions. Concentration of cupric ions in one electrode system is 100 times more concentrated than other. Write the cell reaction and calculate the potential at 300K.	7	L3	CO5
	b.	Explain the principle and instrumentation of colorimetric sensor.	6	L3	CO5
	c.	What are potentiometric sensors? Explain the application of potentiometric sensor in the estimation of iron.	7	L3	CO5
