Model Question Paper-2 with effect from 2021 (CBCS Scheme)

First Semester Engineering Degree Examination

Subject Title 21CHE12/22

TIME: 03 Hours **Max. Marks: 100**

Note: Answer any **FIVE** full questions, choosing at least **ONE** question from each **MODULE**.

		MODULE 1	Marks
Q.1	a	Define Single Electrode Potential. Obtain the expression for single electrode potential.	7
	b	What are ions Selective Electrodes? Explain construction and working of glass electrode	7
	c	Write briefly the recycling of Li-ion battery by direct recycling method	6
		OR	
Q.2	a	Explain the construction, working and applications of Li-ion batteries.	6
	b	Explain the experimental determination of P^H using glass	7
	c	Calculate the single electrode potential of Cu electrode at 27^oC when the standard potential of Cu is 0.34V and [Cu^{2+}] 0.1M	7
Q.3	a	Explain the following factors which affecting the rate of corrosion i) Ratio of anodic and cathodic areas ii) nature of corrosion product	7
	b	What is anodizing? Explain the process of anodizing of Al	6
	c	What is electroless plating? Distinguish between electro and electroless plating.	7
		OR	
Q.4	a	What is meant by metal finishing? Mention (any five) technological importance of metal finishing.	6
	b	A thick steel sheet of area 400 cm^2 is exposed to air near the ocean. After a one year period it was found to experience a weight loss 375 g due to corrosion. If the density of the brass is 7.9g/cm^2 calculate the corrosion penetrating rate in mpy and mm/y (given K= 534 in mpy and 87.6 in mm/y)	7
	c	What is cathodic protection? Explain sacrificial anode and impressed voltage methods of cahtodic protection	7
		MODULE 3	
Q.5	a	What are polymer composites? Explain the synthesis and application of Kevlar fibre	7
	b	What are conducting polymers? Explain the various factors influencing the conduction in organic polymers.	7
	c	Briefly explain the carbon nanotubes with properties and applications.	6

OR			
Q.6	a	Explain optical and electrical properties of nanomaterials.	7
	b	What are nanomaterials? Explain the synthesis of nanomaterials by precipitation method	6
	c	What are Biodegradable polymers? Explain the properties and applications of Polylactic acid.	7
MODULE 4			
Q.7	a	Briefly explain any six basic principles of green chemistry.	6
	b	Explain the following i) Phase transfer catalyst ii) Solvent free reaction	7
	c	With a neat diagram explain the production of Hydrogen by Photocatalytic method	7
OR			
Q.8	a	Describe the hydrogen production by photo electrocatalytic method.	7
	b	Explain the synthesis of Paracetamol by conventional and green route from phenol.	7
	c	Explain the construction and working of photovoltaic cells.	6
MODULE 5			
Q.9	a	Explain the theory, instrumentation and applications of flame photometry.	7
	b	Write the principles and requirement of titrimetric analysis.	7
	c	In a COD test, 30.5 cm^3 and 15.5 cm^3 of 0.05 N FAS solutions were consumed for blank & sample titration respectively. The volume of test sample used was 25 cm^3. Calculate the COD of the sample solution.	6
OR			
Q.10	a	Explain the determination of hardness by EDTA method.	7
	b	Define the following units of standard solution. i) Molarity ii) Normality iii) ppm	6
	c	Explain the theory and instrumentation of potentiometry.	7

Table showing the Bloom's Taxonomy Level, Course Outcome and Program Outcome				
Question		**Bloom's Taxonomy Level attached**	**Course Outcome**	**Program Outcome**
Q.1	(a)	L1, L2	CO.1	PO-1,2,12
	(b)	L2	CO.1	PO-1.2,12
	(c)	L2	CO.1	PO-1,2,12
Q.2	(a)	L1	CO.1	PO-1,2,12
	(b)	L2	CO.1	PO1,2.12
	(c)	L3	CO.I	PO-1
Q.3	(a)	L2	CO.2	PO-1,2,12
	(b)	L2	CO.2	PO-1,2,12
	(c)	L2	CO.2	PO-1,2,12
Q.4	(a)	L1	CO.2	PO-1,2,12
	(b)	L2	CO.2	PO1
	(c)	L2	CO.2	PO-1,2,12
Q.5	(a)	L2	CO.3	PO-1,2,12
	(b)	L2	CO.3	PO-1,2,12
	(c)	L2	CO.3	PO-1,2,12
Q.6	(a)	L2	CO.3	PO1,2,12
	(b)	L2	CO.3	PO-1,2,12
	(c)	L2	CO.3	PO-1,2,12
Q.7	(a)	L2	CO.4	PO-1,2,12
	(b)	L2	CO.4	PO-1,2,12
	(c)	L2	CO.4	PO-1,2,12
Q.8	(a)	L2	CO.4	PO-1,2,12
	(b)	L2	CO.4	PO-1,2,12
	(c)	L2	CO.4	PO-1,2,12
Q.9	(a)	L2	CO.5	PO-1,2,12
	(b)	L2	CO.5	PO-1,2,12
	(c)	L3	CO.5	PO-1
Q.10	(a)	L2	CO.5	PO-1,2,12
	(b)	L2	CO.5	PO-1,2,12
	(c)	L2	CO.5	PO-1,2,12

Bloom's Taxonomy Levels	**Lower order thinking skills**		
	Remembering(knowledge):L_1	Understanding Comprehension): L_2	Applying (Application): L_3
	Higher order thinking skills		
	Analyzing (Analysis): L_4	Valuating (Evaluation): L_5	Creating (Synthesis): L_6