

CBCS SCHEME

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BCHEC102/202

First/Second Semester B.E./B.Tech. Degree Examination, June/July 2025 Applied Chemistry for Civil Engineering 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 are alloys? Write the properties and applications of stainless steel and duralumin.	07	L2	CO1
	b.	Explain the classification of refractories based on chemical composition.	06	L2	CO1
	c.	What is glass? Describe the preparation of soda lime glass.	07	L2	CO1
OR					
Q.2	a.	What is cement? Give the classification of cement.	07	L2	CO1
	b.	What are refractories? Mention the properties and applications of refractories.	06	L2	CO1
	c.	With a neat diagram explain the various steps involved in the manufacture of cement by wet process.	07	L2	CO1
Module – 2					
Q.3	a.	Describe the electrochemical corrosion of steel in concrete.	06	L2	CO2
	b.	Define PV cell. Explain the construction and working of photovoltaic cell.	07	L2	CO2
	c.	What is anodizing? Explain the anodizing of aluminium and mention its applications.	07	L2	CO2
OR					
Q.4	a.	With a neat diagram, explain the construction and working of Li-Ion battery. Mention its applications.	07	L2	CO2
	b.	What is corrosion? Explain the differential metal corrosion with an example.	06	L2	CO2
	c.	Explain the construction, working and applications of Methanol-Oxygen fuel cell.	07	L2	CO2
Module – 3					
Q.5	a.	What is desalination? With a neat diagram describe the desalination of water by electrodialysis method.	07	L2	CO3
	b.	What are nano materials? Explain the following size dependent properties of nano materials : (i) Surface area ii) Catalytic property	06	L2	CO3
	c.	Define COD. In a COD test, 30.2 cm ³ and 14.5 cm ³ of 0.04 N FAS solutions are required for a blank and sample titration respectively. The volume of sample solution used is 25 cm ³ . Calculate the COD of the sample solution.	07	L3	CO3

OR

Q.6	a.	Explain the synthesis of nano materials by Sol-Gel method.	07	L2	CO3
	b.	Write a note on : i) Carbon nano tubes ii) Graphenes	06	L2	CO3
	c.	100 ml of water requires 18 ml of 0.01 M EDTA on titration using EBT indicator. In another experiment 100 ml of the sample water was boiled and filtered required 9 ml of 0.01 M EDTA using EBT indicator. Calculate temporary, permanent and total hardness of sample water.	07	L3	CO3

Module – 4

Q.7	a.	What is polymerization? Discuss the free radical mechanism of addition polymerization.	06	L2	CO4
	b.	Explain the synthesis, properties and applications of Chloro polyvinyl chloride.	07	L2	CO4
	c.	What are fibres? Describe the synthesis, properties and applications of Nylon fibers.	07	L2	CO4

OR

Q.8	a.	What are adhesives? Discuss the synthesis, properties and applications of epoxy resin.	06	L2	CO4
	b.	Define biodegradable polymer. Discuss the steps involved in the preparation of poly lactic acid and mention the applications.	07	L2	CO4
	c.	A polymer sample contains 2 molecules of molecular mass 2000 g/mol, 4 molecules of molecular mass 3000 g/mol and 6 molecules of molecular mass 4000 g/mol. Calculate the number average and weight average molecular mass of polymer sample.	07	L3	CO4

Module – 5

Q.9	a.	State phase rule. Explain the terms involved in the phase rule equation.	07	L2	CO5
	b.	What is conductometric sensor? Discuss the principle and instrumentation of conductometric sensor.	07	L2	CO5
	c.	What is pH sensor? Explain its application in the determination of a soil sample.	06	L2	CO5

OR

Q.10	a.	With the help of a neat phase diagram, describe the Lead-Silver system.	06	L2	CO5
	b.	What is potentiometric sensor? Explain the principle and instrumentation of potentiometric sensor.	07	L2	CO5
	c.	Explain the principle, instrumentation and working of pH sensor.	07	L2	CO5

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