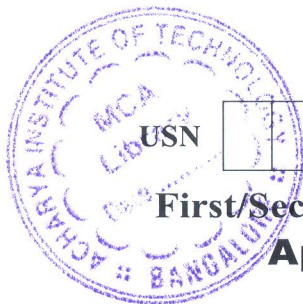


CBCS SCHEME



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BCHEC102/202

First/Second Semester B.E./B.Tech. Degree Examination, June/July 2023 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.	Discuss the production of cement by wet process.	7	L2	CO1
	b.	Define Refractories. Mention the properties and applications of refractory materials.	7	L2	CO1
	c.	Explain the properties and applications of Aluminium and its alloys.	6	L2	CO1
OR					
Q.2	a.	What is glass? Describe the preparation of soda lime glass.	7	L2	CO1
	b.	Explain the testing of cement by EDTA method.	7	L2	CO1
	c.	Write the properties and applications of stainless steel and duralumin.	6	L2	CO1
Module – 2					
Q.3	a.	Define secondary batteries. Explain construction and working of Li-ion Battery.	7	L2	CO2
	b.	What is anodizing? Explain the anodizing of aluminium.	7	L2	CO2
	c.	Explain the construction and working of methanol-oxygen fuel cell.	6	L2	CO2
OR					
Q.4	a.	Describe the electrochemical corrosion of steel in concrete.	7	L2	CO2
	b.	Define PV cell. Illustrate the construction and working of photovoltaic cell.	7	L2	CO2
	c.	Define Batteries. Give the classification of batteries with suitable examples.	6	L2	CO2
Module – 3					
Q.5	a.	What is hard water? Discuss the estimation of total hardness using EDTA solution.	7	L2	CO3
	b.	Define nano material. Explain the synthesis of nano material by Sol-gel method.	7	L2	CO3
	c.	Define COD. In a COD Test, 30 cm ³ and 15 cm ³ of 0.05 N FAS solutions are required for a blank and sample titration respectively. The volume of sample used was 25 cm ³ . Find the COD of the sample solution.	6	L3	CO3
OR					
Q.6	a.	What is Desalination? With a neat labelled diagram, describe the desalination of water by electrodialysis method.	7	L2	CO3
	b.	Explain the following size dependent properties of nano materials: (i) Surface area (ii) Catalytic property	7	L2	CO3
	c.	100 ml of sample water required 18 ml of 0.01 m EDTA for titration using EBT indicator. In another experiment 100 ml of the sample of water was boiled and precipitate was removed by filtration required 9.0 ml of 0.01 m EDTA using EBT indicator. Calculate: (i) Total Hardness (ii) Permanent Hardness (iii) Temporary Hardness	6	L3	CO3

Module – 4					
Q.7	a.	What are adhesives? Give the synthesis, properties and applications of Epoxy Resin.	7	L2	CO4
	b.	A polymer sample contains 1, 2, 3 and 4 molecules having molecular mass 10^5 , 2×10^5 , 3×10^5 and 4×10^5 respectively. Calculate number average and weight average molecular mass of the polymer.	7	L3	CO4
	c.	Mention the properties and applications of geopolymer concrete.	6	L2	CO4
OR					
Q.8	a.	Define biodegradable polymer. Explain the synthesis and applications of polylactic acid.	7	L2	CO4
	b.	Describe the synthesis, properties and applications of polyethylene.	7	L2	CO4
	c.	What are polymer composites? Mention the properties and application of FRP (Fiber Reinforced Polymer).	6	L2	CO4
Module – 5					
Q.9	a.	Define the following terms with examples: (i) Phase (ii) Component (iii) Degree of freedom	7	L2	CO5
	b.	Illustrate the principle, instrumentation and working of potentiometric sensors.	7	L2	CO5
	c.	Explain the determination of pH of soil sample using pH sensors.	6	L2	CO5
OR					
Q.10	a.	With the help of neat phase diagram, describe Lead-Silver system.	7	L2	CO5
	b.	Describe the instrumentation and application of conductometric sensors in the estimation of acid mixture.	7	L2	CO5
	c.	Describe the principle and instrumentation of potentiometric sensors.	6	L2	CO5
