

# CBCS SCHEME

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BCHEM102/202

## First/Second Semester B.E./B.Tech. Degree Examination, June/July 2024 Applied Chemistry for ME Stream

Time: 3 hrs.

Max. Marks: 100

- Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.  
2. M : Marks, L: Bloom's level, C: Course outcomes.  
3. VTU Formula Hand Book is permitted.*

Module – 1			M	L	C
Q.1	a.	Define Calorific value. Explain about the determination of Calorific value of fuel using Bomb calorimeter.	7	L2	CO1
	b.	Calculate GCV and NCV of a fuel from the following data : Mass of fuel = 0.75g, W = 350g, t = 3.02°C, Mass of water = 1150 and % H <sub>2</sub> = 2.8.	7	L3	CO1
	c.	Explain the construction and working of Lithium in Battery along with its applications.	6	L2	CO1
<b>OR</b>					
Q.2	a.	Explain the production of Hydrogen by Electrolysis method and mention its advantages.	6	L2	CO1
	b.	Explain Construction, Working of Photovoltaic cell along with its advantages.	7	L2	CO1
	c.	What are the principles of Green Chemistry? What is Power Alcohol? Explain in brief.	7	L2	CO1
<b>Module – 2</b>					
Q.3	a.	Explain the Electrochemical theory of corrosion in detail taking Iron as an example.	7	L2	CO2
	b.	Explain i) Differential Metal corrosion. ii) Differential Aeration corrosion.	6	L3	CO2
	c.	Describe Galvanizing and mention its application.	7	L2	CO2
<b>OR</b>					
Q.4	a.	What is Sacrificial Anodic Protection? Explain.	6	L2	CO2
	b.	What is Metal Finishing? Mention any five of its Technological importance.	7	L2	CO2
	c.	Distinguish between Electro plating and Electro less plating. Explain Electro plating of Chromium (Decorative).	7	L3	CO2
<b>Module – 3</b>					
Q.5	a.	What are Polymers? Explain the different methods of Polymerization.	7	L3	CO3

	b.	Explain the synthesis of CPVC and mention its applications (CPVC – Chlorinated Polyvinyl Chloride).	6	L2	CO3
	c.	Explain the synthesis , properties and industrial application of Kevlar Fiber.	7	L2	CO3
<b>OR</b>					
Q.6	a.	Explain the synthesis of Polysterene and mention its applications.	7	L2	CO3
	b.	Describe the properties and applications of Lubricants.	6	L2	CO3
	c.	What are Composites? Explain the properties and application of Carbon – based Reinforced composites (Graphene / Carbon nanotube).	7	L2	CO3
<b>Module – 4</b>					
Q.7	a.	Define Phase , Components and Degree of Freedom and Phase rule equation.	6	L2	CO4
	b.	Explain the Principle , Instrumentation and Application of Colorimetry.	7	L2	CO4
	c.	Explain the Principle , Instrumentation and Working of Glass Electrode.	7	L2	CO4
<b>OR</b>					
Q.8	a.	Explain along with diagram Lead – Silver Two Components system.	7	L2	CO4
	b.	Explain the Principle , Instrumentation and Application of Potentiometry sensor.	7	L2	CO4
	c.	Explain the process of estimation of Copper in Industrial water by using Optical sensor.	6	L2	CO4
<b>Module – 5</b>					
Q.9	a.	What are Alloys? Explain the composition along with properties of AlNiCo.	6	L3	CO5
	b.	Explain the synthesis of Nanomaterials by Sol – Gel method.	7	L2	CO5
	c.	Explain the Chemical composition , Properties and Application of Pervoskites.	7	L2	CO5
<b>OR</b>					
Q.10	a.	Explain the composites along with properties of Brass and Stainless steel.	6	L3	CO5
	b.	Explain the size dependent properties of Nano materials and with respect to Catalytic , Thermal and Surface area.	7	L2	CO5
	c.	Explain the properties of application of Carbon Nano tubes and Graphene.	7	L2	CO5

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