

# 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
Module – 2					
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
Module – 3					
Q.5	a.	What are Polymers? Explain the different methods of Polymerization.	7	L3	CO3

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

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