

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

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### First Semester B.Sc (H) Degree Examination Subject Code 21CHE13

**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 radial and angular wave function. Explain the probability distribution curves, shapes of s-orbital	8
	b	What are quantum numbers? Discuss the Principal and azimuthal quantum numbers.	8
	c	State Aufbau and Pauli & exclusion principles	4
<b>OR</b>			
Q.2	a	Define electro negativity of an element. How electro negativity of the elements are determined by Pauling's method. Mention any two applications of electro negativity.	8
	b	Define atomic radius. Discuss the variation of atomic radius across a period and down the group. Explain why halogens relatively high values of electron affinity.	8
	c	Define electron affinity. Give any two important chemical properties of alkali metals.	4
<b>MODULE 2</b>			
Q.3	a	What is homolytic and heterolytic bond breaking? Explain with suitable example	8
	b	What are free radicals? Explain the structure & stability of free radicals	8
	c	What are Electrophile and nucleophiles. Classify the following in electrophiles and nucleophiles NH <sub>3</sub> , AlCl <sub>3</sub> , NO <sub>2</sub> <sup>+</sup> and Cl <sup>-</sup> .	4
<b>OR</b>			
Q.4	a	How alkynes are synthesized by Dehydrohalogenation of (i) Vicinal dihalides (ii) Geminal dihalides	8
	b	How alkenes are prepared by Hoffmann's elimination. Explain Mechanism of electrophilic addition and hydroboration reactions of alkenes.	8
	c	Explain Corey-House synthesis with example	4
<b>MODULE 3</b>			
Q.5	a	Derive an integrated rate equation for rate constant of a first order reaction. Show that for a first order reaction half-life is independent of initial concentration.	8
	b	Derive an expression for the rate constant of a bimolecular reaction based on collision theory	8
	c	Give the differences between order and molecularity of a reaction.	4
<b>OR</b>			
Q.6	a	What are Indicators? Explain the quinonoid theory of indicator by taking phenolphthalein and methyl orange indicator.	8
	b	Explain the pH titration curve for the weak acid and strong base titration and draw the titration curve	6
	c	What is titration curve? Explain the choice of indicator by titration curve	7

<b>MODULE 4</b>			
Q.7	a	What is green Chemistry? Discuss any for principles of green chemistry.	8
	b	Discuss the green synthesis by Rearrangement and addition reaction with suitable example	8
	c	Calculate the atom economy of any two organic reactions of your choice?	4
<b>OR</b>			
Q.8	a	What is green catalysis? Discuss the advantages and disadvantages of using super critical CO <sub>2</sub> as a solvent in place of organic solvent	8
	b	What is bio catalysis? Explain the biocatalytic property of any two enzymes	8
	c	Discuss the comparative statement on green chemistry and synthetic chemistry.	4
<b>MODULE 5</b>			
Q.9	a	Write about the classification of errors. How do you minimize errors in experiments?	8
	b	Explain student-t test and F-test	8
	c	What is accuracy and precision? Explain	4
<b>OR</b>			
Q.10	a	Explain theory, principles and applications of precipitation titration with example.	8
	b	What are random errors? How do you evaluate random errors by statistical methods?	8
	c	Explain the experimental procedure for the estimation of sulphate by gravimetric method.	4

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	
	(b)	L2	CO.1	
	(c)	L2	CO.1	
Q.2	(a)	L1	CO.1	
	(b)	L2	CO.1	
	(c)	L3	CO.1	
Q.3	(a)	L2	CO.2	
	(b)	L2	CO.2	
	(c)	L2	CO.2	
Q.4	(a)	L1	CO.2	
	(b)	L2	CO.2	
	(c)	L2	CO.2	
Q.5	(a)	L2	CO.3	
	(b)	L2	CO.3	
	(c)	L2	CO.3	
Q.6	(a)	L2	CO.3	
	(b)	L2	CO.3	
	(c)	L2	CO.3	
Q.7	(a)	L2	CO.4	
	(b)	L2	CO.4	
	(c)	L2	CO.4	
Q.8	(a)	L2	CO.4	
	(b)	L2	CO.4	
	(c)	L2	CO.4	
Q.9	(a)	L2	CO.5	
	(b)	L2	CO.5	
	(c)	L3	CO.5	
Q.10	(a)	L2	CO.5	
	(b)	L2	CO.5	
	(c)	L2	CO.5	
Bloom's Taxonomy Levels	<b>Lower order thinking skills</b>			
	Remembering( knowledge):L <sub>1</sub>	Understanding Comprehension): L <sub>2</sub>	Applying (Application): L <sub>3</sub>	
	<b>Higher order thinking skills</b>			
	Analyzing (Analysis): L <sub>4</sub>	Valuating (Evaluation): L <sub>5</sub>	Creating (Synthesis): L <sub>6</sub>	