Name:			
Enrolment No:			
UNIVERSITY OF PETROLEUM AND ENERGY STUDIES			
Endsem Examin Course: Chemistry	ation, December2022 Semester: I		
<b>Program:</b> B.Tech (FT, BT and BME)	Time: 3 Hrs		
Course Code: CHEM 1013 SECTIO	Max. Marks: 100           ON - A         20 x 1.5 = 30 Marks		
1. Each Question will carry 1.5 Marks	$\mathbf{DN} - \mathbf{A} \qquad 20 \times 1.5 = 50  \text{Marks}$		
1. Explain briefly why electrons	are easily available to the attacking CO1		
reagents in $\pi$ -bonds?			
2. Explain what happen when het	terolysis takes place in an organic CO1		
compound?			
3. Define carbocation?	CO1		
4. Give the condition for a molec	ule to act as a nucleophile and give CO1		
example	CO1		
5. Briefly discuss Huckel rule?	CO1		
6. Primary carbanion is more stat	ble than tertiary carbanion. Explain CO2		
7. Define order of a reaction?	CO3		
8. Give the wavelength range of	visible radiation. CO3		
9. Asymmetric molecules absorb	infrared radiation. Justify? CO2		
10. Mention the type of polymers	based on their end-use? CO2		
11. Write the name of monomers u	used in the manufacturing of		
(i) PMMA (ii) PE	CO2		
12. Differentiate adsorbent and ad	sorbate with example. CO2		
13. What do you mean by catalytic	c promoter. Give one example. CO3		
14. Polychromatic radiation can no	ot be used in the analysis of compounds		
using spectrometer. Why?	CO3		
15. Briefly explain Beer's law and	give formula.		
16. Give the name of bending vibr	ations when a molecule absorbs infrared		
radiation	CO2		
17. What do you mean by activation	on energy of a reaction. CO2		
18. Define buffer capacity of a buf	ffer solution? CO2		

	19. pH + pOH =	CO3
	20. Give any two major applications of Infrared spectroscopy	
	SECTION – B4 x 5 = 20 Marksach question will carry 5 marksstruction: Write short / brief notes	
Q 1	A: Discuss the major features of adsorption process	CO1
	B: Discuss resonance effect with appropriate example(s)	
Q 2	A. Discuss how Freundlich isotherm will be used to describe the extent of	CO1
	adsorption. Use appropriate formulas and illustrations.	
	B. Which type of polymer can be recycled. Give any two examples with	
	their applications.	
Q 3	A: Discuss the significance of biopolymers	CO3
	B: Discuss what happens when an atom is excited by ultraviolet	
	radiation. Give their types and use illustrations if necessary	
Q 4	A. Draw neat sketch of UV-Visible spectrophotometer and name the	CO2
	components in that. Mention the source of UV & Visible radiation.	
	B. Discuss the various applications of uv-vis spectroscopy in Food	
	Technology/Biotechnology	
	OR	
	Explain the various principles of nuclear magnetic resonance	
	spectroscopy and how it will be used to deduce structure of	
	organic compound	
Section - C2 x 15 = 30 Marks1. Instruction: Write long answer.		
Q 1	<ul> <li>A. Discuss the mechanism of SN<sup>2</sup> reaction and give the various parameters that influence the rate of reaction</li> <li>B. Discuss the mechanism of halogenation by giving the reagent used in the reaction along with resonance structures.</li> </ul>	CO3

Q 2	Complete the following: $a. (CH_3)_2COH - CH_2 - CH_3 \xrightarrow{conc. H_2SO_4} A + B$ $b. CH_3 - C \equiv CH \xrightarrow{CH_3MgBr}$ $c. CH_3 - CHBr - CH_3 + Na \xrightarrow{ether}$	
	d. $CH_3 - CHBr - CH_2Br \xrightarrow{alcoholic KOH}$	
	e. $CH_3 - C \equiv C - CH_3 \xrightarrow{Na/liquid NH_3}$	
	Section – D 2 x 10 = 20 Marks	
	Instruction: Write long answer.	
Q1	A. Discuss Lewis theory of acids and bases with few examples.	CO1
	B. How do you classify buffer solution and give example for each.	
Q2	A. Explain how a catalyst will function in any chemical reaction using energy profile diagram.	CO2
	B. Write notes on "shape selective catalysts" by giving examples	