


Name:			
Enrolment No:			
UPES End Semester Examination, December 2024			
Course: CHEMISTRY Program: B.Tech. (Biotech./Food Tech./Biomed. Engineering) Course Code: CHEM 1001		Semester : I Duration : 3 Hours Max. Marks: 100	
Instructions: Instructions: <ol style="list-style-type: none"> Attempt all part of a question at one place only. Attempt all questions. Calculators and graph papers are not required. 			
S. No.	Section A Short answer questions/ MCQ/T&F (20Qx1.5M= 30 Marks)	Marks	COs
Q 1	A solution with a pH less than 7 is: a) Neutral, b) Acidic, c) Basic d) Amphoteric	1.5	CO1
Q 2	State the formula for calculation of molarity.	1.5	CO1
Q 3	Tell an electronic configuration of copper.	1.5	CO1
Q 4	Which of the following is a weak base? a) NaOH, b) KOH, c) NH ₃ , d) All of the above	1.5	CO1
Q 5	Recall the formula for calculation of pH.	1.5	CO1
Q 6	Give any three examples of adsorption.	1.5	CO1
Q 7	Define desorption?	1.5	CO1
Q 8	Suffix for alcohol in IUPAC nomenclature is: (a) -ol (b) -one (c) -al (d) -oate	1.5	CO1
Q 9	State the stability order for carbocation is: (a) 3 ⁰ >2 ⁰ >1 ⁰ (b) 1 ⁰ >2 ⁰ >3 ⁰ (c) 2 ⁰ >1 ⁰ >3 ⁰ (d) None	1.5	CO1
Q 10	Identify hybridization is present in carbanion? (a) sp ² (b) sp (c) sp ³ (d) sp ³ d	1.5	CO1
Q 11	The term "normality" refers to: a) moles of solute per liter of solution b) gram equivalents of solute per liter of solution c) moles of solute per kilogram of solvent d) volume of solute per volume of solution	1.5	CO1
Q 12	Define bathochromic shift.	1.5	CO1
Q 13	Define homolytic cleavage with an example.	1.5	CO1

Q 14	Write two examples of addition reactions.	1.5	CO1
Q 15	Define enantiomer with an example.	1.5	CO1
Q 16	Which of the following element has atomic number “30”? a) Zinc, b) Chromium, c) Copper, d) Nickel	1.5	CO1
Q 17	Write the full form of PVC and LDPE.	1.5	CO1
Q 18	Define copolymers? Give any one example.	1.5	CO1
Q 19	Define biopolymers with an example.	1.5	CO1
Q 20	Define semi-synthetic polymers with an example.	1.5	CO1
Section B (4Qx5M=20 Marks)			
Q 1	Explain suspension polymerization? Write its advantages and disadvantages.	5	CO2
Q 2	How many grams of NaOH (molar mass = 40 g/mol) are required to make 250 mL of a 0.25 N solution?	5	CO2
Q 3	Explain geometrical isomerism in detail with suitable examples.	5	CO2
Q 4	Explain Beer-Lambert law with suitable examples. Enlist any two applications of UV spectroscopy.	3+2=5	CO2
Section C (2Qx15M=30 Marks)			
Q 1	(a) Discuss various factors affecting common ion effect. (b) Define buffer. Explain any two types of buffers with suitable examples in detail.	7+8=15	CO3
Q 2	(a) Demonstrate the detailed mechanism of SN1 and SN2 reactions with suitable examples. (b) Differentiate electrophile and nucleophile with suitable examples.	10+5=15	CO4
Section D (2Qx10M=20 Marks)			
Q 1	Explain the various applications of polymers in pharmaceutical, medicine, automobiles and daily life with suitable examples.	2.5+2.5+ 2.5+2.5=10	CO3
Q 2	Discuss the different types of catalysis with suitable examples. Enlist their advantages and disadvantages.	1+5+4=10	CO3