


Name:			
Enrolment No:			
UPES End Semester Examination, December 2024			
Course: CHEMISTRY Program: B.Tech. (Biotech./Food Tech/Biomedical Eng.) Course Code: CHEM 1001		Semester : I Duration : 3 Hours Max. Marks: 100	
Instructions: 1. Attempt all part of a question at one place only. 2. Attempt all questions. 3. 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	Which of the following is a weak acid? a) HCl, b) H ₂ SO ₄ , c) CH ₃ COOH, d) HNO ₃	1.5	CO1
Q 2	A solution with a pH greater than 7 is: a) Neutral, b) Acidic, c) Basic, d) Amphoteric	1.5	CO1
Q 3	Write an electronic configuration of chromium.	1.5	CO1
Q 4	Recall the formula for calculation of molality.	1.5	CO1
Q 5	State the relationship between pH and pOH at 25°C?	1.5	CO1
Q 6	Write any three commonly used Absorbents?	1.5	CO1
Q 7	Define adsorption and absorption?	1.5	CO1
Q 8	The suffix for ester in IUPAC nomenclature is: (a) -oate (b) -ide (c) -al (d) -alkoxy	1.5	CO1
Q 9	State the correct stability order for carbanion 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	Which of the following hybridization is present in carbocation? (a) sp ² (b) sp (c) sp ³ (d) sp ³ d	1.5	CO1
Q 11	A buffer solution resists changes in: a) pH b) Temperature c) Volume d) Concentration	1.5	CO1
Q 12	Define hypsochromic shift.	1.5	CO1
Q 13	Define heterolytic cleavage with an example.	1.5	CO1

Q 14	Write any two substitution reactions.	1.5	CO1
Q 15	Define diastereomer with an example.	1.5	CO1
Q 16	Which of the following is not an inert gas? a) Argon b) Neon c) Sodium d) Helium	1.5	CO1
Q 17	Define vulcanized rubber?	1.5	CO1
Q 18	Define polymer with suitable examples.	1.5	CO1
Q 19	Write three examples of biopolymers.	1.5	CO1
Q 20	Write the full form of PMMA and HDPE.	1.5	CO1
Section B (4Qx5M=20 Marks)			
Q 1	Explain bulk polymerization. Write its advantages and disadvantages.	5	CO2
Q 2	How many grams of H ₂ SO ₄ (molar mass = 98 g/mol) are required to make 250 mL of a 0.5 N solution of sulfuric acid?	5	CO2
Q 3	Explain optical isomerism in detail with suitable examples.	5	CO2
Q 4	Explain electronic transition in UV spectrum with a suitable diagram.	5	CO2
Section C (2Qx15M=30 Marks)			
Q 1	(a) Discuss any two colligative properties in detail with appropriate equations and graphs. (b) Demonstrate Lewis theory of acid-base with suitable examples.	10+5=15	CO3
Q 2	(a) Differentiate the detailed mechanism of E1 and E2 reaction with suitable examples. (b) Differentiate electrophile and nucleophile in tabular form.	10+5=15	CO4
Section D (2Qx10M=20 Marks)			
Q 1	Explain the classification of polymers based on their origin, structure, and mode of action with suitable examples.	3+3+4=10	CO3
Q 2	Demonstrate the factors affecting physisorption and chemisorption in detail.	5+5=10	CO3