

QP CODE: D2BCH2502	(Pages: 2)	Reg. No :
		Name :
SECOND SEMESTER FYUGP EXAMINATION, APRIL 2026		
(Regular/Improvement/Supplementary)		
Discipline Specific Core (DSC) Courses - Minor		
CHE2MN107 : BASIC ANALYTICAL AND PHYSICAL CHEMISTRY		
(Credits: 4)		
Time: 2 Hours	Maximum Marks: 70	
Section A		
Answer the following questions. Each carries 3 marks (Ceiling: 24 marks)		
1. What is a stereocenter? Is it related to a chiral center?	BL3	CO1
2. Using suitable structural representations, show the cis and trans isomers of 2-butene. Clearly label each isomer.	BL1	CO2
3. What do you mean by ring-activating groups in aromatic electrophilic substitution? Give two examples.	BL2	CO2
4. Calculate the molality of a solution prepared by dissolving 20 grams of NaCl (molar mass = 58.44 g/mol) in 2 kilograms of water.	BL3	CO2
5. Determine the number of moles in 20g of CO ₂ (molar mass = 44.01 g/mol).	BL3	CO2
6. How does the entropy of a gaseous substance change with (i) increase in temperature and (ii) decrease in pressure.	BL3	CO1
7. Explain the buffer action of ammonium acetate.	BL2	CO1
8. How is the hydrolysis constant of a salt of a weak acid and a strong base related to the ionic product of water.	BL2	CO1
9. What are endothermic and exothermic processes?	BL2	CO1
10. What is meant by the term conjugate acid-base pair?	BL1	CO1
(PTO)		

Section B**Answer the following questions. Each carries 6 marks (Ceiling: 36 Marks)**

11.	What is the entropy change for the conversion of one mole of ice to water at 273 K and 1 atm? (Change in enthalpy of fusion = 6008 kJmol^{-1})	BL3	CO1
12.	What is meant by the coefficient of variation? Mention its importance.	BL2	CO2
13.	What are the various situations responsible for causing error in the result of volumetric analysis?	BL1	CO2
14.	What do you understand by volumetric analysis? Give various classifications.	BL1	CO2
15.	What criteria are used to classify cations into analytical groups for systematic separation, and how do these criteria relate to their chemical behaviors?	BL3	CO2
16.	Describe the mechanisms of Friedel–Crafts alkylation and Friedel–Crafts acylation of benzene.	BL2	CO1
17.	Explain the concept of resonance in benzene with respect to the MO theory.	BL2	CO2
18.	Represent the flying wedge, Newman, Sawhorse, and Fisher projections of molecules, taking one example for each.	BL2	CO2

Section C**Answer any one question. Each carries 10 marks (1 x 10 = 10 Marks)**

19.	(a) Give the relation between Gibb's free energy (G) and entropy (S). (b) Discuss the effect of temperature on the spontaneity of a reaction.	BL2	CO1
20.	What are conformations? Discuss the various conformations and their relative stabilities by taking the example of n-butane.	BL2	CO2

CO : Course Outcome**BL : Bloom's Taxonomy Levels** (1 – Remember, 2 – Understand, 3 – Apply, 4 – Analyse, 5 – Evaluate, 6 – Create)