Reg. No…… **Name …… 26U287**

B.A, B.Sc,B.COM DEGREE END SEMESTER EXAMINATION - APRIL 2026

UGP (HONS.) SEMESTER 2- DISCIPLINE SPECIFIC COURSE COURSE

COURSE : 24UCHEDSC102 - FUNDAMENTALS OF CHEMISTRY - II

(For Regular 2025 Admission and Improvement /Supplementary 2024 Admission)

Time : 1.5 Hours **Max. Marks : 50**

PART A
One Word Questions

(Answer all questions. Each question carries 1 Mark)

1. How many significant figures are present in 5400 mL [A, CO1]
2. ---------- helps to establish the particle nature of light [R, CO2]
3. The de Broglie equation can be used to calculate the wavelength of moving electron if its ---------- is known? [U, CO2]
4. How does the common ion effect influence precipitation? [U, CO3]
5. Which method (Wurtz or Corey-House) would you use to prepare an unsymmetrical alkane? Justify your answer. [A, CO4]
6. Which advantage does oxymercuration have over acid-catalyzed hydration [A, CO4]
7. How can ozonolysis help distinguish between 1-butene and 2-butene? [A, CO4]
8. Predict the product when propyne is reduced using Lindlar's catalyst [A, CO4]

(8 x 1 = 8)

PART B
Short Answer Questions

*(Answer any **five** questions. Each question carries **3** Marks)*

9. Differentiate $f(x) = x^3 e^x$ using the product rule. [A, CO1]
10. List and describe two methods used to minimize systematic errors. [U, CO1]
11. Explain the Compton Effect. [U, CO2]
12. Calculate the uncertainty in the velocity of a particle of mass $1x10^6$ Kg whose uncertainty in position is 9.54 A^0? [A, CO2]
13. Explain the role of solubility product (Ksp) in group separation of cations with examples [U, CO3]
14. Predict the major product formed when 3-pentanol undergoes dehydration. Justify your answer using Saytzeff's rule. [A, CO4]
15. Compare the stereochemistry of hydroboration-oxidation with acid-catalyzed hydration. Which reaction would you prefer for synthesizing a syn alcohol? [A, CO4]
16. Why do terminal alkynes undergo alkylation while internal alkynes do not? Explain with a reaction example. [A, CO4]

(5 x 3 = 15)

PART C
Short Essay Questions

*(Answer any **two** questions. Each question carries **6** Marks)*

17. Define dependent and independent variables in a linear graph. How do they influence the shape of the graph? [U, CO1]

18. What evidence supports the wave-particle dual nature of electrons? [A, CO2]
19. Discuss how Bohr's theory explains the formation of the line spectrum of hydrogen.[U, CO2]
20. How does fractional distillation work? Compare it with simple distillation. [U, CO3]

(2 x 6 = 12)

PART D
Long Essay Questions

*(Answer any **one** question. Each question carries **15** Marks)*

21.a) Explain the different methods of expressing precision in analytical measurements, including mean, median, standard deviation, average deviation, and coefficient of variation**.** How do these statistical tools help in evaluating the reliability of experimental data?(5 Marks) [U, CO1]

b)What is dispersion? Explain (i) Standard deviation, (ii) Average deviation and

(iii) Coefficient of variation. (10 Marks)

22. Answer the following questions:

i) Predict the product when 1-butene undergoes the following reactions:

a) Hydration using dilute H_2SO_4 b) Hydroboration-oxidation

Compare the two reactions based on regioselectivity and stereochemistry.

[A, CO4] *(10 marks)*

ii) A terminal alkyne is treated with sodium amide ($NaNH_2$), followed by ethyl bromide. Predict the final product and explain the reaction mechanism. Why this reaction doesn't work with internal alkynes? [A, CO4] *(5 marks)*

(1 x 15 = 15)

Cognitive Level: R – Remember; U – Understand; A – Apply; An – Analyze; E – Evaluate; Cr – Create