P.R. GOVERNMENT COLLEGE (AUTONOMOUS), KAKINADA
PG SEMESTER II END EXAMINATIONS-SEPTEMBER 2023
M. Sc., : ANALYTICAL& ORGANIC CHEMISTRY: PAPER 1
GENERAL CHEMISTRY-I

| DATE | 07.09.2023 | SESSION | FN | MAX. MARKS | 75 | TIME | 3 HRS |

Time: 3 Hrs   Max. Marks: 75

SECTION: A

Answer **ALL** questions   (4 X 15 = 60 M)

1. (a) Derive the solution for radial and angular orbital wave functions of Hydrogen atom

    (OR)

    (b) Discuss the variation theorem and apply it to calculate the zero-point energy of simple harmonic oscillator

2. (a) Explain different types of symmetry elements and symmetry operations

    (OR)

    (b) Write a note on great orthogonal theorem and construct a character table for C_{2v}?

3. (a) Explain different types of errors and how do you minimize the errors-explain?

    (OR)

    (b) Explain about (a) F-test (b) T-test (c) standard deviation

4. (a) Write Flow chart and computer programme for rate constant for first order reactions by linear least square method

    (OR)

    (b) Write a short note on (i) IF statement (ii) DO statement (iii) GOTO statement

SECTION: B

                                                            (5 X 3 = 15 M)

Answer any **Four** questions

1. Draw the probability density shapes of d orbitals and write the complete wave functions of d-orbitals

2. Estimate the ground state energy of one-dimensional simple harmonic oscillator based on variation method

3. Write about Schoen flies symbols for point groups?

4. Find out the absolute and relative errors, where the actual and measured values are 252.14 mm and 249.02 mm.

5. Write a short note on reducible representations?

6. Write the point groups of following molecules? (a) BF_3 (b) H_3BO_3 (c) C_6H_6

7. Write a shot note on variation theorem?

8. Write the flow chart for standard deviation?