A.D.M.COLLEGE FOR WOMEN, NAGAPATTINAM

(AUTONOMOUS)

M. Sc. (Chemistry) Degree Examination

I Semester – November 2022

CC III – PHYSICAL CHEMISTRY I

Time: 3 hours   **Maximum Marks: 75**

Section –A   **10X2=20**

Answer **ALL** the Questions:

1. What is point group?

2. What are conjugate elements? Give an example.

3. State uncertainty principle.

4. What are Eigen values and Eigen functions?

5. What is meant by the principle of microscopic reversibility?

6. What is photochemical reaction?

7. Write the planck's radiation law equation.

8. What is rotational partition function?

9. Define G value in radiation chemistry.

10. Bring out the differences between the continuous flow and stopped flow techniques employed to study fast reactions.

Answer **ALL** the Questions:

11. a) Explain symmetry elements in group theory.

(or)

  b) Write about reducible and irreducible representations.

12. a) Discuss the salient features of Bohr's theory of hydrogen atom.

(or)

  b) Write a short note on

     i) Hermitian operator   ii) angular momentum operator

13. a) Give an account of Potential energy surfaces.

(or)

  b) Bring out the photochemical reactions between hydrogen and

    bromine.

14. a) Describe Maxwell-Boltzmann distribution law.

(or)
  b) Explain the relationship between partition functions and

    thermodynamic properties.

15. a) Differentiate between radiation chemistry and photo chemistry.

(or)
  b) Describe the Temperature Jump method in fast reactions.

Section –C   **3 X 10 = 30**

Answer any **THREE** Questions:

16. Construct the character table of C_3V and describe it in detail.

17. Derive the Schrodinger wave equation for particle in three dimensional box.

18. Explain absolute reaction rate theory.

19. Describe the comparison of B.E. and F.D. statistics with Boltzmann statistics.

20. Derive Stern-Volmer equation and discuss its application.