M.Sc DEGREE EXAMINATION,APRIL 2019
I Year I Semester
Physical Chemistry - I

Time : 3 Hours   **Max.marks :75**

Section A $(10 \times 2 = 20)$ Marks

Answer any **TEN** questions

1. Define chemical potential

2. What do you mean by fugacity?

3. What are molecular beams?

4. Mention the limitations of collision theory.

5. State Bronsted catalysis law.

6. Give the expression for Taft equation.

7. What do you mean by abelian group?

8. What is direct product representation?

9. State mutual exclusion principle.

10. Give the reduction formula to form irreducible representation.

11. What are excess functions?

12. What do you mean by partition function?

Section B $(5 \times 5 = 25)$ Marks

Answer any **FIVE** questions

13. Discuss the variation of chemical potential with temperature.

14. How is free energy of activation estimated from Eyring equation?

15. Discuss the effect of pressure on reactions in solution.

16. Construct a group multiplication table for C_{3v} point group.

17. Explain the various steps in determining hybridization using group theory.

18. Discuss the mechanism of acid base catalysis.

19. How is partial molar volume determined?

Section C $(3 \times 10 = 30)$ Marks

Answer any **THREE** questions

20. Discuss how fugacity of a gas determined.

21. Discuss the salient features of collision theory and add a note on collision cross section.

22. Discuss the effect of ionic strength on reactions in solution.

23. Explain the various symmetry elements and symmetry operations.

24. Explain the procedure to determine the vibrational modes using group theory.

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