D.K.M. COLLEGE FOR WOMEN (AUTONOMOUS), VELLORE-1
PHYSICAL CHEMISTRY-II

UNIT - I   CHEMICAL KINETICS
Section-A (6 Marks)

1. Discuss in detail about the catalysis by metals

2. Write short note on semiconductor Oxides.

3. Explain the term "Explosion limits" in detail.

4. Give a brief account on Langmuir adsorption isotherm .

5. Derive an expression for freundlich dsorption isotherm

Section-B (15 Marks)

6. Explain about the Rice-Herfeld mechanism of a complex reaction.
7. Describe how BET equation is used to determine the surface of adsorbents.
8. Discuss in detail about the term "Parallel Reactions".
9. Briefly explain the mechanism of heterogeneous catalytic reactions.
10. What is Adsorption coefficient ? Give its significance.
11. What is Chain reaction? Give an example and discuss its kinetics.

UNIT-II
CHEMICAL KINETICS & STATISTICAL THERMODYNAMICS-I
Section-A (6 marks)

1. Explain in detail about the influence of substrate concentration on the rate of enzyme catalysed reaction.
2. Discuss in detail about the competitive inhibhition of enzyme catalysed reaction.

3. Explain in detail about the application of FD statistics to electron gas in metals

4. Compare Maxwell Boltzmann statistics with Bose Einstein and Fermi Dirac statistics.

5. Give a brief account on the limitations of Maxwell Boltzmann distribution law.

6. Explain in detail about the uncompetitive inhibhition.

Section-B (15 marks)

7. Describe in detail about the effect of pH and temperature on the rate of enzyme catalysed reaction

8. Derive the rate expression for the enzyme catalysed reaction taking place in presence of non competititve inhibhitor.

9. Derive Maxwell Bolzmann Distribution law.

10. Derive Bose Einstein and Fermi Dirac distribution law.

UNIT – III   STATISTICAL THEMODYNAMICS – II

Section-A (6 marks)

1. Explain in detail about the translational partition function.

2. Explain in detail about the vibrational partition function.

3. Explain in detail about the rotational partition function.

4. Derive entropy of an ideal monoatomic gas.

5. Discuss the application of partition function.

Section-B (15 marks)

6. Explain in detail about the Einstein theory of specific heat of solids.

7. Discuss in detail about the Debye Heat capacity of solids.

UNIT-IV   PHOTOCHEMISTRY – I

Section-A (6 marks)

1. Write a short notes on Franck Condon Principle.

2. Discuss the kinectics of bimolecular photo phWysical process.

3. Write a short notes on Jablonskis diagram.

4. Write a short notes on Excimers and Excipelxes.

5. Explain about inter crossing system.

Section-B (15 marks)

6. Sketch and explain the Jablonskis diagram of various photochemical pathways.

7. Explain briefly on the stern- Volmer analysis of quenching.

8. Explain briefly on the stern- Volmer equation for fluorescence and phosphorescence

UNIT-V   PHOTOCHEMISTRY – II

Section-A (6 marks)

1. How is the quantum yield of a photochemical reaction determined?

2. Write briefly on photo assisted electrolysis of water.

3. Write a short notes on photo substitution recation.

4. Write a short notes on photoredox recation.

5. Explain in detail about the photovoltaic cell and G-value

Section-B (15 marks)

6. Explain the terms photo isomerization and photo reduction.

7. Explain in detail about the Radiolysis of water.

8. Explain in detail Aspects of solar conversion and Photoelectrochemical cells.

9. Using suitable examples,explain the photosensitized reactions.