10. (a) Determine the vibrational mode for water molecule.

Or

(b) Write the electronic transistion in formaldehyde molecule.

S.No. 355 **17PCH05**

(For the candidates admitted from 2017–2018 onwards)

M.Sc. DEGREE EXAMINATION, APRIL/MAY 2018.

Second Semester

Chemistry

PHYSICAL CHEMISTRY – II

Time : Three hours Maximum : 75 marks

PART A — (5 × 5 = 25 marks)

Answer ALL questions.

1. (a) Write a brief account on distribution of distinguishable and Non-distinguishable particles.

Or

(b) State and explain the principles of Microscopic reversibility.

2. (a) Explain with suitable mechanism of parallel reaction. Give examples.

Or

(b) Discuss the principles of flash photolysis.

3. (a) Write a notes on freundlich adsorption isotherm.

Or

(b) Explain with suitable mechanism of Acid-base catalysis.

4. (a) Discuss the origin of quantum numbers.

Or

(b) Write the ground state term symbol for Fe^{2+} atom.

5. (a) Write a symmetry selection rule for Electronic spectra.

Or

(b) Give the symmetry hybrid orbital in CH_4 molecule.

PART B — (5 × 10 = 50 marks)

Answer ALL questions.

6. (a) Deduce an expression for Maxwell Boltzmann statistics.

Or

(b) (i) State and explain Dlbye theory of Heat capacity of solids. (6)

(ii) Define progogine's principles of minimum entropy production. (4)

7. (a) What is chain reaction? Explain with suitable mechanism of Rice-Herzfeld $H_2 - O_2$ explosion reaction.

Or

(b) Write a notes on the following:

(i) Relaxation method. (5)

(ii) Pressure jump method. (5)

8. (a) (i) Give the difference between physisorption and chemisorption. (7)

(ii) What is adsorption isotherm? What are factors affect it explain. (3)

Or

(b) Derive the mechanism of Michaelis mention equation. Discuss the effect of pH and temperature on its.

9. (a) Discuss the application of schrodinger equation of hydrogen atom problem.

Or

(b) Write the application of perturbation method of Helium atom.