1. Explain the symmetry aspects of molecular vibrations of water molecule.
2. Describe rigid rotor model.
3. What is zero point energy, explain it with diagram.
4. Write a note on Mutual exclusion principle.
5. Describe frank condon
M. Sc. 1 Semester
INTERNAL ASSIGNMENT
All questions are compulsory

Paper 1 (Inorganic Chemistry - I)

1. Explain VSEPR theory.
2. Establish a relation between Stepwise and Overall formation constant.
3. Explain Trans effect.
4. Draw a MO diagram for octahedral complex with a suitable example.
5. Write the application of HSAB concept.
M.Sc. I Semester (Chemistry)  Assignment for ATKT Students
Subject: - Mathematics for Chemists
Note: - Attempt all questions.

Q1. Find the value of \(a.(b \times c)\) where
\[ a = 2i - 3j + k, \quad b = i - j + 2k, \quad c = 2i + j - k \]

Q2. Find the maximum and minimum values of
\[ 2x^3 - 15x^2 + 36x + 10 \]

Q3. Evaluate the integral
\[ \int e^x \sin x \, dx \]

Q4. Solve
\[ (x^3 - 3xy^2) \, dx = (y^3 - 3x^2y) \, dy \]

Q5. One card is drawn from a well-shuffled deck of 52 cards. Calculate the probability that the card will be:

(i) a diamond
(ii) an ace
(iii) a black card

M.Sc. I Semester (Chemistry)  Assignment for ATKT Students
Subject: - Biology for Chemists
Note: - Attempt all questions.

Q1. Give a comparison of plant and animal cells.

Q2. Discuss the conformation of monosaccharides.

Q3. Write a note on lipoproteins.

Q4. Discuss the tertiary structure of proteins.

Q5. Draw the double helix structure of DNA and mention the forces responsible for holding it.
1. Explain aromaticity in benzenoid and non-benzenoid compounds.
2. Write a short note on optical isomerism.
3. Describe the confirmation of cyclohexane.
4. Write the method of determining reaction mechanism.
5. What is NGP? Explain with suitable example.
1. Write the solution of Schrödinger wave equation for 1-D box.
2. Derive the energy level for cyclobutadiene with the help of Huckel theory.
3. Describe the Pauli’s exclusion principle.
5. Derive the Fermi- Dirac statistics.