Method of Submission of Assignment

Each student shall be required to submit two assignments in each theory paper of all programmes where no practical/project work is prescribed. For this purpose, the University administration will set out and provide to each student three different topics in each theory paper; out of which he/she will be required to write out and submit assignment work only on two topics of his/her choice in the answer book provided to him/her for this purpose by the University. Both the assignments, each carrying equal marks, shall be evaluated for the purpose of examination. It is again emphasized that writing of two assignments in each theory paper, where no practical/project work is prescribed, is compulsory and unless it is done and assignment copy submitted to the University on the date of the examination of the theory portion of the concerned paper, the study requirement of the student will not be taken to have been completed and he/she will be declared to have failed. Besides, it has, now, been decided by the University to club the marks obtained by a student in his/her assignment work/project work with the marks obtained by him/her in the written examination of that paper to determine his/her pass percentage in the concerned paper. Hence, it is in student's interest that he/she submits the assignment work in time. Students are also advised to prepare their assignments very carefully and meticulously. They must write assignment in their own handwriting. Assignment answers should not be copied from the learning material supplied by the University or from any other source. Assignments must be submitted in the answer books provided to the students by the University for this purpose. In no case, assignment written in private copy will be accepted by the University. In case of loss of assignment copy, fresh assignment copy may be procured from the University on payment of Rs.200.00 by bank draft. Similarly, Project-Work, wherever prescribed, must also be submitted by the fixed date, failing which the student will be deemed to have failed in the concerned subject.
ASSIGNMENT QUESTIONS
M.Sc Part-I (Chemistry)
Paper I to III and V Practical Work

Answer Any Two Questions.

1. Explain: (a) Pauli Exclusion Principle. (b) Operators.
2. (a) Discuss the postulates of Quantum mechanics. (b) What is Eigen function and Eigen value?
3. What is maximum electron density in H–atom in the 2s and 2p states?

Answer Any Two Questions.

1. What is carbohydrate? Establish the ring structure of glucose.
2. Discuss and derive the structure of atropine? Establish its structure by synthesis.
3. Write notes on any (a) Inversion of sucrose. (b) Peptides linkage.

Answer Any Two Questions.

1. How the supramolecular catalysts are similar to enzyme catalyst? What are differences between them?
2. Write notes on: (a) SNCB mechanism. (b) Photochemical reaction.
3. Explain the isomerisation of octahedral complexes and intermolecular rearrangement?

Answer Any Two Questions.

1. Establish the structure of Vitamin B₁₂. Give the synthesis of Vitamin B₁₂.
2. Discuss the structure of Phytopil.
3. Discuss the point linkage between quinonic acid and mesoquinone of quinine.

ASSIGNMENT QUESTIONS
M.Sc. Part-I (Environmental Science)
PAPER-I

Answer Any Two Questions.

1. Define Ecosystem. Discuss various components of ecosystem.
2. What do you mean by flow of energy in an ecosystem? Describe in detail.
3. Write an essay on ecological pyramids.

PAPER-II, III and IV (Practical)
PAPER-V

Answer Any Two Questions.

1. Write an essay on new probable sources of energy.
2. "Ocean is the storehouse of resources". Elucidate the statement with examples.
3. Describe the economic and environmental importance of forest resources.

PAPER-VI (Practical)
PAPER-VII

Answer Any Two Questions.

1. What are the environmental effects of oil exploration, transportation and uses?
2. Discuss the impact of air pollution on human health.
3. What do you understand by Urban Heat Island? Explain it with reasons.
ASSIGNMENT QUESTIONS
M.Sc. Part-I (Geography)

Paper-I

Answer Any Two Questions.(सभी प्रश्न 10-10 अंकों के हैं)

1. Present an analytical study of geography as a Landscape Science.
2. Give an account of quantitative revolution in geography.
3. Describe the meaning and scope of applied geography.

Paper-V

Answer Any Two Questions.(सभी प्रश्न 10-10 अंकों के हैं)

1. Describe the cultural regions of India.
2. Describe the industrial regions of India.
3. Give a geographical account of South Bihar Plain.

ASSIGNMENT QUESTIONS
M.Sc. Part-I (Home Science)

PAPER-I
(Practical Work)

PAPER-II

Answer Any Two Questions. (सभी प्रश्न 10-10 अंकों के हैं)

2. Write an essay on importance of extension teaching aids.
3. Discuss the principles and scope of community development.

Paper-III

Answer Any Two Questions.(सभी प्रश्न 10-10 अंकों के हैं)

1. Discuss the Principles of growth and development.
2. What is gestational age? Describe its various stages.
3. Describe the sensory abilities and innate functions of the newborn.

Paper-IV
(Practical)

Paper-V

Answer Any Two Questions.(सभी प्रश्न 10-10 अंकों के हैं)

1. Define saving. Discuss the importance of saving in detail.
2. Define Consumer and discuss their characteristics.
3. Present a brief description of the history of consumer education.
Paper-VI

Answer Any Two Questions.(सभी प्रश्न 10-10 अंकों के हैं)

1. Discuss the stages of research in detail.
   शोध के चरणों की विस्तारपूर्वक विवेचना कीजिए।
2. Define the variable and mention the types of variables.
   चर को परिभाषित कीजिए तथा चर के प्रकारों का उल्लेख कीजिए।
3. What is the hypothesis ? Describe the different types of hypothesis.
   परिकल्पना क्या है ? परिकल्पना के विभिन्न प्रकारों का वर्णन कीजिए।

Paper-VII

Answer Any Two Questions.(सभी प्रश्न 10-10 अंकों के हैं)

1. What is guidance programme service ? Describe its main types.
   निर्देशन कार्यक्रम सेवा क्या है ? इसके मुख्य प्रकारों का वर्णन कीजिए।
2. Describe the skills needed for a good guide.
   एक अच्छे निर्देशक के लिए आवश्यक दक्षताओं का वर्णन कीजिए।
3. What is counselling ? Explain its nature and scope.
   परामर्शन क्या है ? इसके रूप एवं क्षेत्र की व्याख्या कीजिए।

Paper-VIII
(Paper-II, III, IV, VI, VII and VIII – Practical)

ASSIGNMENT QUESTIONS
M.Sc. Part-I (Mathematics)

Paper-I

Answer Any Two Questions.(सभी प्रश्न 10-10 अंकों के हैं)

1. State and prove fundamental theorem of Galois theory.
2. State and prove Jordan-Holder theorem on any group.
3. State and prove Kronecker's theorem.

Paper-II

Answer Any Two Questions.(सभी प्रश्न 10-10 अंकों के हैं)

1. (a) State and prove Bolzano-Weierstrass theorem and give a suitable example of it.
   (b) Deduce Bolzano-Weierstrass theorem from Heine-Borel theorem.
2. State and prove inverse function theorem.
3. State and prove implicit function theorem.

Paper-III

Answer Any Two Questions.(सभी प्रश्न 10-10 अंकों के हैं)

1. State and prove Fatou's Lemma.
2. State and prove Lebesque monotone convergence theorem.
3. State and prove dominated convergence theorem.

Paper-IV

Answer Any Two Questions.(सभी प्रश्न 10-10 अंकों के हैं)

1. (a) What do you mean by a regular space. Prove that a compact Hausdorff space is regular.
   (b) Prove that every compact subspace of the real line is closed and bounded.
2. Prove that an arbitrary intersection of topological spaces is a topological space.
3. (a) Define $T_3$-space and $T_4$-space and prove that every $T_4$-space is a $T_3$-space.
   (b) Prove that every compact subspace of a Hausdorff space is closed.

Paper-V

Answer Any Two Questions. (सभी प्रश्न 10-10 अंकों के हैं)

1. Prove that a linear operator $E$ is a projection on some subspace iff it is an idempotent.
2. (a) Prove that a partially ordered set $(P(X), \subseteq)$ is a lattice.
   (b) If $R$ is a ring and $L$ is a lattice of all ideals of $R$, then prove that $L$ is a modular.
3. (a) Prove that a Boolean Algebra $B$ is a complemented distributive lattice.
   (b) Prove that in Boolean Algebra, the complement of an element is unique.
Answer Any Two Questions.

1. Find Taylor’s expansion of the function \( f(z) = \frac{z}{z^2 + 9} \) around \( z = 0 \).
2. State and prove Poisson’s integral formula.
3. State and prove Cauchy’s theorem.

Answer Any Two Questions.

2. Find the Rodrigue’s formula for Legendre polynomial.
3. (a) Derive an expression for the generating function for Bessel’s function.
   (b) Prove that \( J_{-n}(x) = (-1)^n J_n(x) \) where \( n \) is a +ve integer.

Answer Any Two Questions.

1. (a) Define a countable set. Prove that \([0, 1]\) is uncountable.
   (b) If \( A \) and \( B \) are two countable sets then show that \( A \times B \) is also countable.
2. (a) Define isomorphism between two graphs and give two examples of isomorphic graphs.
   (b) Determine the difference between a circuit and Eulerian circuit.
3. (a) State and prove Chinese remainder theorem.
   (b) State and prove the division algorithm of integers.

ASSIGNMENT QUESTIONS

M.Sc. Part-I (Physics)

Answer Any Two Questions.

1. Starting with the series expansion, derive Rodrigues formula for Legendre polynomials.
2. Derive integral representation of \( J_n(x) \), the Bessel’s function of first kind of order \( n \).
3. State and explain clearly Fourier transform and the convolution theorem.

Answer Any Two Questions.

1. Discuss the scattering of particles by a spherically symmetric potential. Explain partial waves and phase shift.
2. State and explain Fermi golden rule. What do you understand by adiabatic and sudden approximation?
3. Describe time independent perturbation theory to get a good approximation to the non-degenerate energy eigenvalues.

Answer Any Two Questions.

1. Establish electromagnetic field tensor.
2. Deduce Larmour’s formula for a non-relativistic accelerated charge.
3. Discuss the motion of a charged particle in oscillating electromagnetic fields.

Answer Any Two Questions.

1. Derive Fermi-Dirac distribution law.
2. Derive the Virial equation of state and evaluate the Virial coefficients.
3. What are critical indices? Explain the different scaling relations and the critical indices.

Answer Any Two Questions.

1. Account for the nature of force existing between a proton and a neutron in a deuteron in the ground state.
2. Derive an expression for the partial wave expansion of a plane wave.
3. Write a detailed note on the classification of elementary particles.

Paper VI to VIII

Practical Work