

# **MANONMANIAM SUNDARANAR UNIVERSITY**

**DIRECTORATE OF DISTANCE AND CONTINUING EDUCATION**

**INTERNAL ASSIGNMENT FOR MAY 2025 EXAMINATIONS**

**M. Sc Physics – Second Semester**

**Statistical Mechanics**

**Subject Code: SPHM21**

**1.) (A) Discuss the Landan Theory of Phase Transtions.**

**(OR)**

**(B) How to calculate the entropy of an ideal gas using mizro canonical ensemble.**

**2.) (A) Explain in details**

**i) Cononical ensembles and**

**ii.) Grand canonical ensembles**

**(OR)**

**(B) Show the derivation of Bose – Einstein condensation.**

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**M. Sc Physics – Second Semester**

**Quantum Mechanics - I**

**Subject Code: SPHM22**

- 1.) (A) Explain the time dependent Schrodinger equation and state the postulation of quantum mechanics.

**(OR)**

- (B) Explain the one dimensional periodic potential using Kronig – Penney model.

- 2.) (A) Derive the expression of time independent perturbation theory for non-degenerate energy levels.

**(OR)**

- (B) Calculate the ground state energy of Hydrogen atom using variation method.

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**M. Sc Physics – Second Semester**

**Advanced Optics**

**Subject Code: SPHE21**

- 1.) (A) What are the type of LASER? Construction of solid state LASER and its application.

**(OR)**

- (B) How total internal reflection principle applied in optical fiber?

- 2.) (A) Write down the principles for
- i.) Harmonic generation.
  - ii.) Second harmonic generation
  - iii.) Third harmonic generation

**(OR)**

- (B) Explain the phenomenon of double refraction by Kerr electro-optic effect and Pockels electro-optic effect.

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**INTERNAL ASSIGNMENT FOR MAY 2025 EXAMINATIONS**

**M. Sc Physics – Second Semester**

**Sewage and Waste Water Treatment and Reuse**

**Subject Code: SPHE22**

- 1.) (A) What are the different methods of water recovery? Explain the methods in detail.

**(OR)**

- (B) How can you disinfect and sterilize the waste water?

- 2.) (A) Explain the theory of chemical disinfection treatment?

**(OR)**

- (B) Explain the theory of physical disinfection treatment?

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**INTERNAL ASSIGNMENT FOR MAY 2025 EXAMINATIONS**

**M. Sc Physics – Second Semester**

**Physics for Competitive Examinations**

**Subject Code: SPHS21**

- 1.) (A) Brief the concepts of physical quantities, SI system of units, Dimensions, Scalar and Vectors.

**(OR)**

- (B) Define Black body Radiation and state Stefan – Boltzmann law.

- 2.) (A) Explain the young's double slit and single slit experiment?

**(OR)**

- (B) State the following three laws

- i) Coulomb's law
- ii.) Biot – savart law
- iii.) Gauss - law