

# MANONMANIAM SUNDARANAR UNIVERSITY

DIRECTORATE OF DISTANCE AND CONTINUING EDUCATION

INTERNAL ASSIGNMENT FOR MAY 2024 EXAMINATIONS

**M. Sc Physics – Second Semester**

**Statistical Mechanics**

**Subject Code: SPHM21**

1.) (A) Discuss the Landau Theory of Phase Transitions.

(OR)

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

2.) (A) Explain in details

i) Canonical 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 – Penning 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 – optics effect and Pockels electro – optic effect.

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**INTERNAL ASSIGNMENT FOR MAY 2024 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 2024 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