



ANNAMALAI UNIVERSITY

(Accredited with 'A+' Grade by NAAC)

DIRECTORATE OF DISTANCE EDUCATION

Annamalainagar – 608 002

S019 - M.SC PHYSICS

Semester Pattern: 2023-24

Instructions to submit First Semester Assignments

1. Following the introduction of semester pattern, it becomes **mandatory for candidates to submit assignment for each course.**
2. Assignment topics for each course will be displayed in the A.U, DDE website (**www.audde.in**).
3. Each assignment contains 5 questions and the candidate should answer all the 5 questions. Candidates should submit assignments for each course separately. (5 Questions x 5 Marks =25 marks).
4. Answer for each assignment question should not exceed 4 pages. Use only A4 sheets and write on one side only. **Write your Enrollment number on the top right corner** of all the pages.
5. Add a template / content page and provide details regarding your Name, Enrollment number, Programme name, Code and Assignment topic. Assignments without template / content page will not be accepted.
6. Assignments should be handwritten only. Typed or printed or photocopied assignments will not be accepted.
7. **Send all First semester assignments in one envelope.** Send your assignments by Registered Post to The Director, Directorate of Distance Education, Annamalai University, Annamalai Nagar – 608002.
8. Write in bold letters, “ASSIGNMENTS – FIRST SEMESTER” along with PROGRAMME NAME on the top of the envelope.
9. Assignments received after the **last date with late fee** will not be evaluated.

Date to Remember

Last date to submit first semester assignments : **15.11.2023**

Last date with late fee of Rs.300 (three hundred only) : **30.11.2023**

Dr. T.SRINIVASAN
Director

S019 - M. Sc Physics - First Semester

019E1110 - CLASSICAL AND STATISTICAL MECHANICS

(5 x 5 = 25 Marks)

1. Generalized momentum and energy based On Lagrangian formulation
2. Energy of a one-dimensional Harmonic oscillator using Hamilton-Jacobi equation.
3. Maxwell – Boltzmann law of distribution of velocities under kinetic theory of gases.
4. State and discuss Liouville's theorem by elaborating the principle of conservation of density in phase space.
5. Discuss about the classical treatment of Gibb's paradox in entropy of the joint system of perfect gas and explain how it can be resolved quantum mechanically?

019E1120 – ELECTRONICS

(5 x 5 = 25 Marks)

1. Briefly discuss the Principle Working and applications of Photodiode.
2. Write short notes on
 - (i) Class-B amplifier.
 - (ii) Class-C amplifier.
 - (iii) Push-pull amplifier.
3. Explain the operation of one stage of two phase dynamic MOS shift register, using a complete diagram.
4. Discuss the essential features of BJT and MOSRAMS. Illustrate by circuit diagrams.
5. List the ROM applications and differentiate between ROM and RAM.

019E1130 - MATHEMATICAL PHYSICS (5 x 5 = 25 Marks)

1. Find the ranks of the following matrix

(i) $\begin{bmatrix} 6 & 1 & 3 & 8 \\ 4 & 2 & 6 & -1 \\ 10 & 3 & 9 & 7 \\ 16 & 4 & 12 & 15 \end{bmatrix}$ (ii) $\begin{bmatrix} 2 & -1 & 3 \\ 1 & 1 & 1 \\ 1 & -1 & 1 \end{bmatrix}$

2. Find the inverse of the matrix

(i) $\begin{bmatrix} -2 & 6 & 4 \\ 1 & -3 & 2 \\ 1 & 5 & 2 \end{bmatrix}$ (ii) $\begin{bmatrix} 1 & 0 & 1 \\ -2 & 1 & 0 \\ 0 & -1 & 1 \end{bmatrix}$

3. S.T. the matrix $A = \begin{bmatrix} o & c & -b \\ -c & o & c \\ b & -a & a \end{bmatrix}$ satisfy Cayley Hamilton theorem

4. A covariant tensor has components xy , $2y-z^2$, xz in rectangular coordinates. Find its covariant components in spherical coordinates.
5. Express the operators gradient, laplacian, divergence and curl in tensor form.
