

**Semester Pattern: 2023-24**

**[ January Session ]**

**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, CDOE website ([www.audde.in](http://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, Center for Distance and Online 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 : **15.04.2024**

Last date with late fee of Rs.300 (three hundred only) : **30.04.2024**

**Dr. T. SRINIVASAN**  
Director

**First year M. Sc Physics**  
**Semester –I (January session)**  
**Assignment**

**019E1110 - CLASSICAL AND STATISTICAL MECHANICS**

1. Derive the Lagrangian equation in generalized coordinates for the motion of a system of particles.
2. State and prove Hamilton Jacobi equation for Hamilton's principle function.
3. Maxwell – Boltzmann law of distribution of velocities under kinetic theory of gases.
4. 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?
5. Discuss Bose-Einstein distribution law and discuss its results

## 019E1120 – ELECTRONICS

1. a. Write short notes on 1. Half wave rectifier 2. Full Wave rectifier.  
b. Write short notes on 1. UJT 2. JFET 3. MOSFET
2. Write short notes on
  - i. RC coupled amplifier
  - ii. Hartley and Colpitt's oscillator
  - iii. Phase shift oscillator.
3. Draw circuit of a triangular wave generator using an op-amp. Explain its operation by drawing the capacitor voltage wave form.
4. a. List the ROM applications and differentiate between ROM and RAM.  
b. Write short notes on
  1. Weighted resistor network
  2. Dual slope of ADC
5. a. Describe RTL family.  
b. Explain the basic monolithic integrated circuits.

## 019E1130 - MATHEMATICAL PHYSICS

1. Find the inverse of the matrix

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

2. Obtain an expression for Bessel's differential equation.  
3. Discuss the properties of Gamma functions.  
4. Determine the following Inverse laplace Transform

i.  $L^{-1} \left[ \frac{1}{(s-3)^5} \right]$

ii.  $L^{-1} \left[ \frac{1}{s(s+a)} \right]$

5. Evaluate using Cauchy's integral formula  $\int_c \frac{dz}{z-a}$  where  $c$  is a simple closed curve and  $z = a$  is a point inside  $c$ .