A N N A M A L A I U N I V E R S I T Y

(Accredited with 'A+' Grade by NAAC)

CENTRE FOR DISTANCE AND ONLINE EDUCATION

Annamalainagar – 608 002

Semester Pattern: 2024-25

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**).

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, Centre 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   :   20.11.2024
   Last date with late fee of Rs.300 (three hundred only)   :   30.11.2024

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Dr. T.SRINIVASAN
Director

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019E1110: CLASSICAL AND STATISTICAL MECHANICS

1. Derive the Lagrangian equation in generalized coordinates for the motion of a system of particles
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

1. a. Describe the construction and working of a p-channel depletion type MOSFET.
   b. Write short notes on

   i. Class-B amplifier, **ii.** Class- C amplifier, **iii.** Push-pull amplifier.

2. Explain transistor RC coupled amplifier with reference to frequency response and applications.
3. Discuss the essential features of BJT and MOSRAMS. Illustrate by circuit diagrams.
4. List the ROM applications and differentiate between ROM and RAM.
5. **a.** Explain the basic monolithic integrated circuits.

   b. Discuss the diffusion of impurities in to the silicon chip

019E1130: MATHEMATICAL PHYSICS

1. a. 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) $\begin{bmatrix} 2 & -1 & 3 \\ 1 & 1 & 1 \\ 1 & -1 & 1 \end{bmatrix}$

   b. Find the inverse of the matrix

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

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

3. **a.** Express the operators gradient, laplacian, divergence and curl in tensor form.
   b. Obtain an expression for Bessel's differential equation.

4. Solve the following differential equation using laplace transform
$$y'' + 9y = 0, y(0) = 0, \qquad y'(0) = 1.$$

5. Evaluate the integral $\int_{-\infty}^{\infty} \frac{dx}{1+x^2}$.