

Semester Pattern: 2024-25

Instructions to submit Third 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 Third 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 – THIRD 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 Third semester assignments : **15.04.2025**

Last date with late fee of Rs.300 (three hundred only) : **30.04.2025**

Dr. T. SRINIVASAN

Director

CENTRE FOR DISTANCE AND ONLINE EDUCATION

S019 – M.Sc. PHYSICS

SECOND YEAR – III SEMESTER

ASSIGNMENT TOPICS

019E2310: CONDENSED MATTER PHYSICS – I

1. a. Discuss the structural features of CsCl, ZnS and Diamond close packing structures.
b. Explain London theory.
2. a. Discuss powder method of powder diffractometer.
b. Deduce reciprocal lattice for BCC and FCC.
3. Explain various crystal imperfections
4. Discuss the Debye model of heat capacity.
5. a. Discuss Hall effect and magnetoresistance
b. Outline Kronig-Penny model

019E2320: QUANTUM MECHANICS - II

1. Discuss time Zeeman and Stark effect..
2. a. Discuss semi classical theory of radiation?
b. Determine transition probability for a harmonic perturbation
3. Discuss variation method and find the upper limit of energy of the ground state of helium atom using variation method.
4. Outline the Hartree and Hartree-Fock approximations.
5. Write Dirac's linear Hamiltonian for free particle and find out matrices for α and β . Using Relativistic Dirac equation to show that electron is endowed with spin $\frac{1}{2}$.

019E2330: NUCLEAR AND ELEMENTARY PARTICLE PHYSICS

1. Explain the concept of scattering length and effective range in the study of low energy n-p scattering and deduce an expression for the S-wave scattering cross section in terms of scattering length and effective range.
2. Write down the Bethe Weizsacker's mass formula and explain the various terms that contribute to it. Given the mass number A, find the most stable isobar.
3. Discuss the compound nucleus theory. Derive Breit-Wigner one level formula.
4. Discuss the Bohr Wheeler theory of nuclear fission. What is the fissionability parameter and obtain the condition for the spontaneous fission.
5. a. Discuss CPT theorem.
b. Write Down the Gell-Mann-Okubo mass formula and explain how masses of hadrons are related.