



ANNAMALAI UNIVERSITY

(Accredited with 'A+' Grade by NAAC)

CENTRE FOR DISTANCE AND ONLINE EDUCATION

Annamalainagar – 608 002

Semester Pattern: 2025-26

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, Centre 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 : 01.11.2025

Last date with late fee of Rs.300 (three hundred only) : 15.11.2025

Director
CDOE

CENTRE FOR DISTANCE AND ONLINE EDUCATION

SECOND YEAR – III SEMESTER

S018 – M.Sc MATHEMATICS

018E2310 : COMPLEX ANALYSIS – I

(5x5=25)

1. Show that the real and imaginary parts of an analytic function are harmonic. .
2. State and Prove Luca's theorem.
3. Prove that, every rational function has a representation by partial fractions
- 4 Show that, every convergent sequence is a Cauchy sequence.
5. State and prove Cauchy's Theorem for a rectangle

(5x5=25)

018E2320 : SET TOPOLOGY

1. Let X be metric space. Show that, a subset G of X is open $\Leftrightarrow G$ is a union of open spheres
2. Let X be a complete metric space, and Y be a subspace of X . Prove that, Y is complete $\Leftrightarrow Y$ is closed.
3. State and Prove Baire's Theorem
4. State and Prove Lindelof's Theorem
5. a) Show that, any continuous image of a compact space is compact
b). Prove that, every closed and bounded subspace of the real line is compact

(5x5=25)

018E2330 : GRAPH THEORY

1. Prove that The number of edges in a tree on v vertices is $v-1$.
2. Prove that For a graph G with $\varepsilon, = v-1$, the following statements are equivalent
 1. G is connected
 2. G is Acyclic
 3. G is a tree
3. State and Prove Hall's Theorem
4. State and Prove Tutte's Theorem.
5. Prove that a bipartite graph G has a perfect matching iff $|N(S)| \geq |S|$ for all $S \subset V(G)$..

018E2340 : PROBABILITY THEORY

1. If two dice are thrown, what is the probability that the sum is
 - a) Greater than 8 and
 - b) neither 7 nor 11?
2. State and Prove Inversion Theorem
3. Find the mean and Variance of Binomial Distributions from MGF.
4. Let (X,Y) be a bivariate normal rv with parameters $\mu_1, \mu_2, \sigma_1^2, \sigma_2^2$, and ρ , and let $U = aX + b$, $a \neq 0$, and $V = cY + d$, $c \neq 0$. Find the joint distribution of (U,V) .
5. The regression lines of Y on X and X on Y are respectively
 $Y = aX + b$ and $X = cY + d$

Show that the ratio of the S.D's of y and X is $\sqrt{a/c}$ and the arithmetic means are

$$\bar{X} = (bc + d)/(1 - ac) \quad \bar{Y} = (ad + b)/(1 - ac)$$
