



Dr. B. R. Ambedkar Open University
Faculty of Sciences
Department of Mathematics
II Semester, I Year, M.Sc. Mathematics, AY 2025-26
Course -1, Complex Analysis
ASSIGNMENT-1

Max Marks: 15

Min. Marks: 6

I. Answer all the following questions.

(5 X 3 =15 Marks)

1. State and prove the Cauchy-Riemann Equations.
 2. State and Prove Cauchy's Integral Formula.
 3. State and Prove Cauchy-Hadamard Inequality.
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ASSIGNMENT-2

Max Marks: 15

Min. Marks: 6

I. Answer all the following questions.

(5 X 3 =15 Marks)

1. Find the radius of convergence of each of the following power series.

$$(i) \sum_{n=0}^{\infty} \frac{z^n}{n!} \quad (ii) \sum_{n=0}^{\infty} n! z^n \quad (iii) \sum_{n=1}^{\infty} \frac{z^n}{n}$$

2. Show that $\int_0^{\pi} \frac{d\theta}{3+2\cos\theta} = \frac{\pi}{\sqrt{5}}$.
 3. Prove that $\{a_n\}$ be a sequence of positive terms $\sum (1+a_n)$ and $\sum (1-a_n)$ converges iff $\sum a_n$ converges.
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Dr. B. R. Ambedkar Open University
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Department of Mathematics
II Semester, I Year, M.Sc. Mathematics, AY 2025-26
Course -2, Partial Differential Equations

ASSIGNMENT-1

Max Marks: 15

Min. Marks: 6

I. Answer all the following questions.

(5 X 3 =15 Marks)

1. Verify that the equation $yz \, dx + 2xz \, dy - 3xy \, dz = 0$ is integrable and find its primitive.
2. Find the solution of the equation $\frac{\partial^2 z}{\partial x^2} - \frac{\partial^2 z}{\partial y^2} = x - y$.
3. Obtain the Fourier series for the function $f(x) = e^{-x}x$ in the interval $0 < x < 2\pi$.

ASSIGNMENT-2

Max Marks: 15

Min. Marks: 6

I. Answer all the following questions.

(5 X 3 =15 Marks)

1. Derive the partial differential equation of heat conduction in two dimensions.
2. Find the deflection $u(x, y, t)$ of the square membrane of each side unity and $c = 1$, if the initial velocity is zero and initial deflection is $F(x, y) = A \sin \pi x \sin 2\pi y$.
3. Find the steady state temperature in a circular plate of radius a whose circumference is kept at temperature $f(\theta)$. The plate is insulated so that there is no loss of heat from either surface.



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Department of Mathematics
II Semester, I Year, M.Sc. Mathematics, AY 2025-26
Course -3, Discrete Mathematics

ASSIGNMENT-1

Max Marks: 15

Min. Marks: 6

I. Answer all the following questions.

(5 X 3 =15 Marks)

1. Obtain the principal conjunctive normal form of the formula.
$$(P \rightarrow (Q \wedge R)) \wedge (\neg P \rightarrow (\neg Q \wedge \neg R)).$$
2. State and prove Distributive Inequality.
3. Let B be a finite Boolean algebra. Then prove that B is isomorphic to the Boolean algebra $P(X)$ of all subsets of suitable set X .

ASSIGNMENT-2

Max Marks: 15

Min. Marks: 6

I. Answer all the following questions.

(5 X 3 =15 Marks)

1. Prove that A graph G is disconnected if and only if its vertex set V can be partitioned into two disjoint subsets V_1 and V_2 such that there is no edge in G whose one end is in V_1 and other end in V_2 .
2. State and establish the Euler's formula relating to a planar graph.
3. Solve the Recurrence relation $a_n = 2(a_{n-1} - a_{n-2}), n \geq 2$ and $a_0 = 1, a_1 = 2$.



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Department of Mathematics
II Semester, I Year, M.Sc. Mathematics, AY 2025-26
Course -4, Field Extensions & Galois Theory

ASSIGNMENT-1

Max Marks: 15

Min. Marks: 6

I. Answer all the following questions. (5 X 3 =15 Marks)

1. State and Prove Unique Factorization Theorem.
2. State and prove the division algorithm for polynomials.
3. Let F be a field and a polynomial $f(x) \in F[x]$ of degree $n \geq 1$. Then can it have at most n roots in any extension field K of F .

ASSIGNMENT-2

Max Marks: 15

Min. Marks: 6

I. Answer all the following questions. (5 X 3 =15 Marks)

1. Show that every finite separable extension of a field F is a simple extension of F .
2. State and prove Fundamental Theorem of Galois Theory.
3. Let F be a field and $f(x) \in F[x]$. Then prove that $f(x)$ is solvable by radicals over F if and only if $G(E/F)$ is a solvable group, where E is the splitting field of $f(x)$.