TAMILNADU OPEN UNIVERSITY

Chennai-15
School of Sciences

HOME ASSIGNMENT

Programme Code No	:	231
Programme Name	:	M.Sc., Mathematics.
Course Code/Name/Credit	:	MMSS-11 /Abstract Algebra /4
Batch	:	CY 2025 (1st SEMESTER)
No. of Assignment	:	2
Semester/Non-Semester	:	Semester
Maximum CIA Marks	:	30 Marks (Average of total no. of assignments)

ASSIGNMENT - I

Answer any ONE of the following three questions in 1000 words

1. State and Prove First Sylow Theorem.

2. Let G be group and suppose that G is the internal direct product of $N_1, N_2, \ldots\ldots Nn$. Let $T = N_1 \times N_2 \times \ldots\ldots \times Nn$. Then G and T are isomorphic.

3. Every finite abelian group is the direct product of its cyclic subgroups.

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ASSIGNMENT - II

Answer any ONE of the following three questions in 1000 words

1. Every finite Extension of a finite extension is finite.

2. An element $a \in k$ is algebraic over F if and only if F(a) is a finite extension of F.

3. If K is a splitting field of some polynomial over F, then K is a normal extension of F.

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HOME ASSIGNMENT

Programme Code No	:	231
Programme Name	:	M.Sc., Mathematics.
Course Code/Name/Credit	:	MMSS-12 /Advanced Calculus /4
Batch	:	CY 2025 (1st SEMESTER)
No. of Assignment	:	2
Semester/Non-Semester	:	Semester
Maximum CIA Marks	:	30 Marks (Average of total no. of assignments)

ASSIGNMENT - I

Answer any ONE of the following three questions in 1000 words

1. State and Prove Basic Mean Value Theorem and Give an Example.

2. State and Prove Euler's Theorem and Give an Example.

3. State and Prove Existence Theorem for Implicit Function.

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Course Code/Name/Credit	:	MMSS-12 /Advanced Calculus /4
Batch	:	CY 2025 (1st SEMESTER)
No. of Assignment	:	2
Semester/Non-Semester	:	Semester
Maximum CIA Marks	:	30 Marks (Average of total no. of assignments)

ASSIGNMENT - II

Answer any ONE of the following three questions in 1000 words

1. State and Prove Taylor's Theorem for Functions of two Variables.

2. State and Prove First form of Green's Theorem.

3. State and Prove Gauss's Theorem.

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HOME ASSIGNMENT

Programme Code No	:	231
Programme Name	:	M.Sc., Mathematics.
Course Code/Name/Credit	:	MMSS-13 / Real Analysis /4
Batch	:	CY 2025 (1st SEMESTER)
No. of Assignment	:	2
Semester/Non-Semester	:	Semester
Maximum CIA Marks	:	30 Marks (Average of total no. of assignments)

ASSIGNMENT - I

Answer any ONE of the following three questions in 1000 words

1. Let f be monotonically increasing on (a,b). Then f(x+) and f(x-) exist at every point of x of (a,b). More precisely

$$\sup_{a<t<x} f(t) = f(x-) \leq f(x) \leq f(x+) = \inf_{x<t<b} f(t)$$

Further, if $a < x < y < b$, then $f(x+) \leq f(y-)$

2. If $f_1 \in \mathfrak{R}(\alpha)$ and $f_2 \in \mathfrak{R}(\alpha)$ then $f_1 + f_2 \in \mathfrak{R}(\alpha)$ and $\int_a^b (f_1 + f_2)d\alpha = \int_a^b (f_1)d\alpha + \int_a^b (f_2)d\alpha$

3. State and Prove The stone - Weierstrass theorem.

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Maximum CIA Marks	:	30 Marks (Average of total no. of assignments)

ASSIGNMENT - II

Answer any ONE of the following three questions in 1000 words

1. The Outer measure of an interval equal its length.

2. Let c be any real number and let f and g be real-valued measurable functions defined on the same measurable set E. Then f + c, cf, f + g, f - g and f g are also measurable.

3. State and Prove Fatou's Lemma.

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HOME ASSIGNMENT

Programme Code No	:	231
Programme Name	:	M.Sc., Mathematics.
Course Code/Name/Credit	:	MMSSE-1/ Differential Geometry /3
Batch	:	CY 2025 (1st SEMESTER)
No. of Assignment	:	2
Semester/Non-Semester	:	Semester
Maximum CIA Marks	:	30 Marks (Average of total no. of assignments)

ASSIGNMENT - I

Answer any ONE of the following three questions in 1000 words

1. Find the Curvature and Torsion of the curve of intersection of two quadric surfaces
   $ax^2 + by^2 + cz^2 = 1$ and $a'x^2 + b'y^2 + c'z^2 = 1$

2. Find the Curvature and Torsion of the Spherical indicatrix of the principal normal.

3. Derive the Differential equation of geodesics.

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HOME ASSIGNMENT

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Batch	:	CY 2025 (1st SEMESTER)
No. of Assignment	:	2
Semester/Non-Semester	:	Semester
Maximum CIA Marks	:	30 Marks (Average of total no. of assignments)

ASSIGNMENT - II

Answer any ONE of the following three questions in 1000 words

1. Discuss the nature of geodesics on the right helicoid $x = u \cos v$, $y = u \sin v$, $z = av$.

2. State and Prove Hilbert Lemma.

3. Derive the equation of second fundamental form.

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HOME ASSIGNMENT

Programme Code No	:	231
Programme Name	:	M.Sc., Mathematics.
Course Code/Name/Credit	:	MMSSE-2/Programming in C++ /3
Batch	:	CY 2025 (1st SEMESTER)
No. of Assignment	:	2
Semester/Non-Semester	:	Semester
Maximum CIA Marks	:	30 Marks (Average of total no. of assignments)

ASSIGNMENT - I

Answer any ONE of the following three questions in 1000 words

1. Explain BASIC DATA TYPES with an Example.

2. Explain Expressions and Their Types.

3. Explain C++ Program with Class.

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ASSIGNMENT - II

Answer any ONE of the following three questions in 1000 words

1. Explain Static Data members.

2. Explain Pointer to Members.

3. Explain Dynamic Constructors.