



TAMILNADU OPEN UNIVERSITY

Chennai - 15
School of Science

ASSIGNMENT

Programme Code No	: 132
Programme Name	: B.Sc., Mathematics with Computer Applications
Course Code & Name	: BMC-21, Groups and Rings
Batch	: AY 2020-21(2 nd Year)
No. of Assignment	: One Assignment for Each 2 Credits
Maximum CIA Marks	: 25 (Average of Total No. of Assignments)

Assignment – I

Max. : 25 Marks

Answer any ONE of the question not exceeding 1000 words.

1. Define product of two subgroups, illustrate and state a necessary and sufficient condition for product of two subgroups to be a subgroup.
2. a) Define Centre of a group, illustrate and prove that the centre of a group G is a subgroup of G .
b) Write a note on Normalizer in group.
3. Write a note on Symmetric group.

Assignment – II

Max. : 25 Marks

Answer any ONE of the question not exceeding 1000 words.

1. State and prove Lagrange's theorem, proving necessary results.
2. Define Index of a subgroup of a group, illustrate and prove that If H and K are two subgroups of G of finite index in G then $H \cap K$ is a subgroup of finite index in G .
3. Find the number of generators of the group $(\mathbb{Z}_{12}, \oplus)$, proving all necessary results.

Assignment – III

Max. : 25 Marks

Answer any ONE of the question not exceeding 1000 words.

1. State and prove the fundamental theorem of homomorphism on groups.
2. a) Define a field, give example and prove that any finite integral domain is a field.
b) Prove that a finite commutative ring R without zero-divisors is a field.
3. State and prove Cayley's Theorem.

Assignment – IV

Max. : 25 Marks

Answer any ONE of the question not exceeding 1000 words.

1. Show that any integral domain D can be embedded in a field F and every element of F can be expressed as a quotient of two element of D .
2. Prove that any Euclidean domain R is a unique factorization domain.
3. State and prove the fundamental theorem of homomorphism on rings.



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ASSIGNMENT

Programme Code No	: 132
Programme Name	: B.Sc., Mathematics with Computer Applications
Course Code & Name	: BMC-22, Classical Algebra and Numerical Methods
Batch	: AY 2020-21(2 nd Year)
No. of Assignment	: One Assignment for Each 2 Credits
Maximum CIA Marks	: 25 (Average of Total No. of Assignments)

Assignment – I

Max. : 25 Marks

Answer any ONE of the question not exceeding 1000 words.

1. Find the condition that the roots of the equation $ax^3 + 3bx^2 + 3cx + d = 0$ may be in Geometric Progression and hence solve the equation $27x^3 + 42x^2 - 28x - 8 = 0$.
2. Show that the sum of the ninth powers of the roots of the equation $x^3 + 3x + 9 = 0$ is zero.
3. Sum the series $\sum_{n=0}^{\infty} \frac{(n+1)^3}{n!} x^n$

Assignment – II

Max. : 25 Marks

Answer any ONE of the question not exceeding 1000 words.

1. Solve the equation $x^5 + 4x^4 + x^3 + x^2 + 4x + 1 = 0$.
2. .Solve the equation $x^4 - 4x^3 + 4x^2 + x - 2 = 0$ by finding the rational roots.
3. If α, β, γ are the roots of the equation $x^3 - 7x + 7 = 0$, find $\frac{1}{\alpha^4} + \frac{1}{\beta^4} + \frac{1}{\gamma^4}$.

Assignment – III

Max. : 25 Marks

Answer any ONE of the question not exceeding 1000 words.

1. Evaluate $\int_1^3 \frac{1}{x} dx$ by Simpson's rule with 4 strips and 8 strips respectively.

2. Given the differential equation $\frac{dy}{dx} = \frac{x^2}{y^2+1}$ with $y(0) = 0$. Obtain $y(0.25)$, $y(0.5)$ and $y(1.0)$ correct to four decimal places by Picard's method of

Successive approximations.

3. Applying Lagrange's formula, find a cubic polynomial which approximates the following data and hence find $y(1)$.

X	-2	-1	2	3
Y(x)	-12	-8	3	5



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HOME / SPOT ASSIGNMENT

Programme Code No	: 132
Programme Name	: B.Sc., Mathematics with Computer Applications
Course Code & Name	: BMC-23 & Programming in C and C++
Batch	: AY 2020-21 (2 nd Year)
No. of Assignments	: One Assignment for Each 2 Credits
Maximum CIA marks	: 25 (Average of Total No. of Assignments)

ASSIGNMENT – 1

Max : 25 marks

Answer any one of the question not exceeding 1000 words

1. What is a manipulator? Explain the use of I/O manipulators with example.
2. Explain the different types of Arrays in detail.
3. Describe the various file stream classes.

ASSIGNMENT - 2

Max : 25 marks

Answer any one of the question not exceeding 1000 words

1. List out the various control structures available in C++. Give an example
2. What is a constructor? Explain the different types of constructors.
3. Explain Unified Modeling Language in detail.

ASSIGNMENT – 3

Max : 25 marks

Answer any one of the question not exceeding 1000 words

1. What is inheritance? Explain with an example
2. Discuss about command-line arguments with an example.
3. How is polymorphism achieved at
 - (a) Compile time
 - (b) Run time – Discuss.