



TAMIL NADU 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 2018-19 – II Year
No.of Assignment : One Assignment for Each 2 Credits
Maximum CIA Marks : 25 (Average of Total No. of Assignments)

Assignment – I

Answer any one of the questions not exceeding 1000 words

Max: 25 Marks

1. Write a note on Symmetric group.
2. Define product of two subgroups, illustrate and state a necessary and sufficient condition for product of two subgroups to be a subgroup.
3. 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.

Assignment – II

Answer any one of the questions not exceeding 1000 words

Max: 25 Marks

1. Find the number of generators of the group $(\mathbb{Z}_{12}, \oplus)$, proving all necessary results.
2. State and prove Lagrange's theorem, proving necessary results.
3. 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 .

Assignment – III

Answer any one of the questions not exceeding 1000 words

Max: 25 Marks

1. State and prove Cayley's Theorem.
2. State and prove the fundamental theorem of homomorphism on groups.
3. 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.

Assignment – IV

Answer any one of the questions not exceeding 1000 words

Max: 25 Marks

1. State and prove the fundamental theorem of homomorphism on rings.
2. 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 elements of D .
3. Prove that any Euclidean domain R is a unique factorization domain.



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Programme Code No : 132
Programme Name : B.Sc., Mathematics with Computer Applications
Course Code & Name : BMC-22, Classical Algebra and Numerical Methods
Batch : AY 2018-19 – II Year
No.of Assignment : One Assignment for Each 2 Credits
Maximum CIA Marks : 25 (Average of Total No. of Assignments)

Assignment – I

Answer any one of the questions not exceeding 1000 words

Max: 25 Marks

1. Sum the series $\sum_{n=0}^{\infty} \frac{(n+1)^2}{n!} x^n$
2. 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 $27x^3 + 42x^2 - 28x - 8 = 0$.
3. Show that the sum of the ninth powers of the roots of the equation $x^3 + 3x + 9 = 0$ is zero.

Assignment – II

Answer any one of the questions not exceeding 1000 words

Max: 25 Marks

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

Assignment – III

Answer any one of the questions not exceeding 1000 words

Max: 25 Marks

- 1 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

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

3. 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.



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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 2018-19 – II Year
No.of Assignment : One Assignment for Each 2 Credits
Maximum CIA Marks : 25 (Average of Total No. of Assignments)

Assignment – I

Answer any one of the questions not exceeding 1000 words

1. Explain Control statements available in C.
2. Write a note on Storage Class.
3. Write a note on a) Polymorphism b) Function overloading

Assignment – II

Answer any one of the questions not exceeding 1000 words

- 1 Explain User defined functions in C.
2. Write a note on Arrays in C.
3. Write a note on Structures and unions in C.

Assignment – III

Answer any one of the questions not exceeding 1000 words

1. Write a program to read a quadratic equation and print the roots using function.
2. Write C functions (i) to read a $m \times n$ matrix (ii) to print a $m \times n$ matrix (iii) to find the sum of two matrix. Use it in the main program to read two matrix and to print their sum if possible.

3. Write a C program to create a structure with field members name of an item, item code, cost of each item and quantity in stock. Read the data and update the data using a function and calculate the total value using another function print the output.