

Assignment – Set 1

B.Sc. Mathematics, Dum Dum Motijheel Rabindra Mahavidyalaya

Paper Name: Algebra Paper Code: MTMMIN101T

Full Marks: 20

Q. No.	Marks	Bloom's Level	Knowledge Type
1	10	R, U	Conceptual
2	10	U	Conceptual
3	10	Ap	Procedural
4	10	Ap	Procedural

Answer five questions.

(5 × 4 = 20)

1. Find the fifth roots of unity using De-Moivre's theorem.
2. Prove Cauchy's inequality for real numbers.
3. Let G be a group. Prove that the identity element of G is unique.
4. Determine the rank of the matrix

$$A = \begin{pmatrix} 1 & 2 & 3 \\ 2 & 4 & 6 \\ 1 & 1 & 1 \end{pmatrix}.$$

5. Find the eigenvalues and eigenvectors of the matrix

$$A = \begin{pmatrix} 2 & 1 \\ 1 & 2 \end{pmatrix}.$$

Shyamal Saha
14/10/26

14/10/2026

Assignment – Set 2

Full Marks: 20

Q. No.	Marks	Bloom's Level	Knowledge Type
1	10	R, U	Conceptual
2	10	U	Conceptual
3	10	Ap	Procedural
4	10	Ap	Procedural

Answer five questions.

(5 × 4 = 20)

1. State and prove the relation between roots and coefficients of a quadratic equation.
2. Define cyclic group. Prove that every cyclic group is abelian.
3. Prove that the inverse of each element in a group is unique.
4. Find the adjoint and inverse of the matrix

$$A = \begin{pmatrix} 2 & 1 & 1 \\ 1 & 1 & 0 \\ 1 & 0 & 1 \end{pmatrix}.$$

5. Find the matrix of the linear transformation

$$T(x, y, z) = (x + y, y + z, x + z).$$

Instructions

1. The assignment must contain a cover page with the following details and must be submitted with spiral binding:
 - a. Name
 - b. Semester
 - c. Registration No.
 - d. College Roll No.
2. Acknowledgement page.
3. Conclusion page.

Last date for submission of Assignment: 26/11/2026.

Shyamal Saha
14/10/26

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