North Gauhati College
Department of Mathematics

SEMESTER II(GENERAL)
HOME ASSIGNMENT 2021

E-201 (NON-CBCS)
Abstract Algebra and Matrices

October 2021 TOTAL MARKS: 30

INSTRUCTIONS TO CANDIDATES

1. This assignment paper contains **Three (3)** questions and comprises **Two (2)** printed pages.
2. Answer all questions. The marks for each question are indicated at the beginning of each question.
3. Submit the assignment as a single **PDF** file through the online portal of our college website under section "Assignments".
4. Write your **Name**, **GU Roll No.**, and **Registration Number** in the assignment .
5. Submission **Due Date** is on or before 8th October, 2021.

1. Define [2×5=10]

(i) Group (ii) Cyclic Group (iii) Normal Sub-Group
(iv) Ring (v) Ideal

2. Answer *any two* of the following: [5×2=10]

(i) Prove that set of natural number is a group with respect to addition.

(ii) Show that cyclic group is abelian.

(iii) If in a ring R, $x^2 = x \ \forall x \in R$ then show that R is commutative.

3. Answer the following: [4+6=10]

(i) Define symmetric and skew-symmetric matrix. Give an example for each.

(ii) Define orthogonal matrix. If A is an orthogonal matrix, then prove that A^T and A^{-1} are also orthogonal.

END OF PAPER