

North Gauhati College
Department of Mathematics

SEMESTER III
HOME ASSIGNMENT II 2021

MAT-SE-3024
Combinatorics and Graph Theory

August 2021

TOTAL MARKS: 30

INSTRUCTIONS TO CANDIDATES

1. This assignment paper contains **Six (6)** questions and comprises **Two (2)** printed pages.
2. Each question carry **Five** marks. Answer all questions.
3. Submit the assignment as a single **PDF** file through the online portal of our college website under section “Assignments” and send a copy to the email id mathngc1969@gmail.com.
4. Write your **Name, GU Roll No., and Registration Number** in the assignment .
5. Submission **Due Date** is on or before **15th August, 2021**.

1. Represent the graph $G(V, E)$ where the vertex set V and the edge set E are as follows:

$$V = \{1, 2, 3, 4\}$$

$$E = \{(x, y) : x + y \text{ is odd}\}.$$

2. Show that a complete graph with n vertices consists of $\frac{n(n-1)}{2}$ edges.
3. How many edges and vertices are there in the graph of $K_{2,5}$ and draw K_5 , $K_5 + K_1$.
4. Prove that the sum of the degrees of all vertices of a graph is an even integer.
5. How many vertices are there in a graph with 15 edges, if each vertex is of degree 3.
6. Prove that for any graph G with six vertices, G or \bar{G} contains a triangle.

END OF PAPER