

North Gauhati College
Department of Mathematics

SEMESTER III(HONOURS)
HOME ASSIGNMENT II 2021

MAT-HC-3026
Group Theory - I

August 2021

TOTAL MARKS: 30

INSTRUCTIONS TO CANDIDATES

1. This assignment paper contains **Four (4)** questions and comprises **Two (2)** printed pages.
2. Each question carry **Ten** marks. Answer any **Three** of 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 **10th August, 2021**.

(Answer any **Three**)

1. H is a normal subgroup of G if and only if H' is a normal subgroup of G' , and if H' is normal in G' , then $\frac{G'}{H'} \cong \frac{G}{H}$.
2. State and prove Cayley's theorem on a group G .
3. Prove that every quotient group of a cyclic group is cyclic.
4. Let G be a group and p be a prime such that $p|O(G)$. Prove that there exist $x \in G$, such that $O(x) = p$.

END OF PAPER