Assignment 1

1. Let G be a group such that $\mathrm{Aut}(G)=\{1\}$. Prove that G must be abelian. If G is finite with $\mathrm{Aut}(G)=\{1\}$, then show $o(G)=1$ or 2. (1)

2. True or false? G_1, G_2 are groups, G_1 is isomorphic to a subgroup of G_2 and G_2 is isomorphic to a subgroup of G_1, then G_1 is isomorphic to G_2. (Justify answer). (1)

3. Let R be a commutative ring with identity 1. Let $U=\left\{\begin{pmatrix}1 & x\\ 0 & 1\end{pmatrix} \middle| x\in R\right\}$. Prove that U, with matrix multiplication as its product, is a group isomorphic to $(R,+)$. (1)

4. G be a group such that $x^3=e \ \forall x\in G$. Is G abelian? Justify. (1)

Write solutions neatly on A_4 size papers.
Submit on MOODLE latest by 28th August.