TMC - 104_Unit-3
Assignment-3

1. **Show that the sets S = {1,5,7,11} is a group with respect to multiplication modulo 12.**
2. **Show that the set G = {$x+y\sqrt{3}$: x,y ∈ Q} is a group w.r.t. addition.**
3. **Find the order of each element of the group G = {1,-1,i,-i}.**
4. **State and prove Lagrange's theorem.**
5. **Show that (Z,+) is a cyclic group also discuss it's generator.**
6. **Find all the left cosets of (H,+) in (G,+), where G = Z and H = {4x: x∈Z}.**
7. **Prove that a group G is abelian iff the mapping f:G→G, given by $f(x)=x^2$, is a homomorphism.**
8. **Prove that an infinite cyclic group is isomorphic to (Z,+).**
9. **Compute $a^{-1}ba$ if a=(134), b=(2354).**
10. **Show that (C,+, .) is a commutative ring with unity.**
11. **Show that the set of all real numbers of the form $a+b\sqrt{2}$, where a and b are real numbers, forms a field under the operation of addition and multiplication.**