**Abstract Algebra**

**Revision**

1. Define the term an operation \* as applied in abstract algebra
2. Show that on the set R is an operation
3. Define the term a group as applied in abstract algebra
4. Given that G=

Show that G forms a group under matrix multiplication

1. Let G= {0, 1, 2, 3, 4,5} define a binary composition + on G by where c is the least non negative remainder got by dividing by 6.Show that <G,+> forms an Abelian group
2. Let G be a group. Suppose that we have for any elements a,b in G. also suppose that G has no element of order 3.Prove that G is an abelian group.
3. If R is a ring and a, b, c, d are in R, evaluate
4. If in a ring R, every x in R satisfies .prove that R must commutative.[9]
5. Prove that if a, b are in R, then is non commutative
6. Let R be the field of real numbers and Q be the field of rational numbers. In R, are both algebraic over Q;
7. Formulate a polynomial of degree 4 over Q satisfied by
8. What is the degree of over Q
9. Prove that is irreducible over the integers mod 7
10. Let G be the group of all non-zero complex numbers a + bi (a, b real, but not both zero) under multiplication, and let Verify that H is a subgroup of G 13. If N is a normal subgroup of G and H is any subgroup of G. Prove that NH is a subgroup of G.

End