**Tutorial Sheet-ODD Semester 2022**

**15B11CI212 Theoretical Foundation of Computer Science**

**Tutorial 7**

**Note: Complete the Tutorial-6 also.**

1. Define an operation ∗ on R as x ∗ y = x + y + xy. Prove or disprove: (R, ∗) is a group
2. Prove or disprove that the set G = {1, 3, 7, 9} is a group under multiplication modulo 10.
3. If G is a group such that for all a, b ∈ G, then show that G must be abelian.
4. let (A,+,.) be a ring such that a.a =a for all a in A.
5. Show that a + a = 0 for all a, where 0 is the additive identity.
6. Show that the operation . is commutative.
7. Let (Z, \*) be an algebraic structure, where Z is the set of integers and the operation \* is defined by n \* m = maximum of (n, m). Show that (Z, \*) is a semi group. Is (Z, \*) a monoid ?. Justify your answer.
8. Show that the set of all strings ͚S͛ is a monoid under the operation ͚concatenation of strings͛.
9. If (G, \*) is a group and a ∈ G such that a \* a = a , then show that a = e , where e is identity element in G.