:Definitions 1-3

Airing (R , ∗ , ∘) is called a belian . ring if (R , (1)
.∘) is a belian semi-group

Airing (R, ∘) is called a ring with identity if (2)
there exists an identity element E ∈ R , such that a
.∘ e = e ∘ a = a , ∀ a ∈ R

A ring of invertible elements is a ring (R, ∗, ∘) (3)
.if (R, ∗) is a group of invertible elements

I.e. each element of (R, ∘) has a unique inverse.
.And is denoted by (R*, ∗, ∘)

Examples (R* , + , •) is a ring of invertible 1-4 4
element (R , + ,•) , (Z , + , .) , (Ze , + , .) , (Q, +,)

.Theorem : Each ring has a unique identity

Proof: Suppose (R , ∗, ∘) is a ring has identity e
. ` and e

Hence ∀ a ∈ R , we get a ∘ e = a and a ∘ è = a ∴ a ∘
e = a ∘ è

Thus R has a unique identity

Theorem : Each non -zero element in the ring has a .unique inverse

. Proof: Let (R , $\ast$, $\circ$) be a let $0 \neq a \in R$

: Suppose a^{-1} , à $\in$ R are inverse of a implies

a $\circ$ à = e and a $\circ$ à So a $\circ$ a^{-1} = a $\circ$ à $a^{-1} \circ$ (a $\circ$ a^{-1}) = $a^{-1} \circ$ (a $\circ$ à) ($a^{-1} \circ$ a) $\circ$ a^{-1} = ($a^{-1} \circ$ a) $\circ$ à

e $\circ$ a^{-1} = e $\circ$ à a^{-1} = à $\Longrightarrow$

.Thus a has a unique inverse