Semester VI

CC 14 (Unit 1) 1ˢᵗ Unit Test

F.M.: 10   *Time: 30 Min*

Answer any two questions. $2 \times 5 = 10$

1. State and prove 1ˢᵗ ring Isomorphism theorem.
2. State and prove Division Algorithm in a polynomial ring.
3. (i) Find the field of quotient of the integral domain
$$Z[\sqrt{2}] = \{a + b\sqrt{2}: a, b \in R\}$$
   (ii) Prove that if R be a ring and $f(x), g(x)$ be polynomial in $R[x]$, then
$$\deg(f(x)g(x)) \leq \deg(f(x)) + \deg(g(x))$$
$$2 + 3$$
4. Let R and R' be two rings and $\emptyset: R \to R'$ be an onto homomorphism. If R be a commutative ring, then show that R' is commutative. Is the converse true? Justify your answer. $3 + 2$