Department of Mathematics
Internal Examination 2023
4th Semester
CC-08

F.M.:-15   Time: 40 min

Answer any 3 questions from the following. $5 \times 3 = 15$

1. Define divisor of zero in a ring. Prove that a ring R satisfies cancellation law if and only if R is without zero divisor. $1 + 4$

2. Define integral domain. Prove that for any positive integer n, the ring Z_n of all integers modulo n is an integral domain if and only if n is prime integer. $1 + 4$

3. Let $\oplus$ and $\odot$ be defined on the set of all integers Z by the rule $a \oplus b = a + b - 1$ and $a \odot b = a + b - ab$ for $a, b \in Z$. Prove that $(Z, \oplus, \odot)$ is a ring with unity. Is it commutative ring? $4 + 1$

4. Define a field. Prove that a finite integral domain is a field. $2 + 3$