

FIRST INTERNAL EXAM-2022, CC-10
F.M.-10, TIME:30min.

Answer any two questions.

1. Is the symmetric group abelian ? Justify your answer. Find the inverse of each element of S_3 .

or

Find the eight symmetries of a square and show that they form a non-abelian group.

2. Examine whether the sets $A=\{1,11\}$ and $B=\{1,7,13,19\}$ form subgroups of $U(20)$ under multiplication modulo 20. Find order of 2 in Z_{10} under addition modulo 10.

or

Show that the set of all units in a ring R with unity forms a group with respect to multiplication.

3. Prove that the intersection of two subrings is a subring.

or

Show that every field is an integral domain. Is its converse true ? Justify your answer.