

1st Internal Examination

Semester III

MATH-H-CC-T-06

F.M.: 20

Time: 50 Minutes

1. Answer any four questions

$5 \times 4 = 20$

- a) If G be a finite cyclic group of order n , generated by a , prove that a^m is a generator of G if and only if m is prime to n .
- b) State and prove Lagrange's Theorem.
- c) Prove that the union of two subgroup is a subgroup if and only if one is contained in another.
- d) Prove that a subgroup H of a group G is a Normal sub-group of G if and only if for every $x \in G$ and for every $h \in H$, $xhx^{-1} \in H$.
- e) Prove that every subgroup of a Cyclic group is Cyclic.

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