

Quiz-IV
MTH-204, MTH-204A
ABSTRACT ALGEBRA
Fall-2014
Date: 13th November 2014

Time Allowed: 45 mins

Max. Marks: 15

1. Prove that a group of order 36 can not be simple. [4]

2. Prove that every group of order p^2 is abelian, where p is a prime. [3]

3. Let G be an abelian group of order 16. Suppose that there are elements a, b in G such that

$o(a) = o(b) = 4$ and $a^2 \neq b^2$. Write G as a direct product of cyclic groups. [3]

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4. Prove or disprove that if R is an integral domain and I is a non-zero proper ideal of R , then R/I is an integral domain. [2]

5. Let R be a ring and $x, u \in R$ such that $x^n = 0$ for some n and u is a unit. Prove that $x + u$ is a unit in R . [3]