

C.U.SHAH SCIENCE COLLEGE, AHMEDABAD

SEMESTER-IV (MATHEMATICS)
INTERNAL EXAMINATION , MAT-205

Date:- 21/03/2016

Marks:50

INSTRUCTION: Write the answer of quiz on **first** page of Answer sheet.

Q-1 In a finite group G , prove that the order of each element of G is also f

OR

Q-1 An element $[m]$ in Z_n has a multiplicative inverse iff $(m,n) = 1$.

Q-2 Define equivalence relation. Prove that the relation $a \equiv b \pmod{H}$ is an equivalence relation.

OR

Q-2 In a group G , the equation $a*x=b$ and $y*a=b$, where a and b are in G have unique solution.

Q-3 If K is Normal Subgroup of G and H is Normal Subgroup of G then prove that

(a) $K \cap H$ is a normal subgroup of K .

(b) KH is a subgroup of G .

OR

Q-3 Let H be a normal subgroup of G iff $HaHb = Hab, \forall a,b \in G$.

Q-4 Prove that Isomorphism between two groups is an equivalence relation. Also prove that

$(G;o) \cong (G';*)$ then G is commutative iff G' is commutative.

OR

Q-4 Prove that a subgroup of a cyclic group is also cyclic.

QUIZ

(1) If set A containing n elements then there are _____ binary operation.

(a) n^{n^2} (b) n^2 (c) n^n (d) 2^n

(2) $[7]$ has multiplicative inverse in Z_{15} is _____.

(a) $[1]$ (b) $[2]$ (c) $[3]$ (d) $[4]$

(3) g.c.d. of 1440 and 288 is _____.

(a) 4320 (b) 1440 (c) 72 (d) 288

(4) If $O(G)=36, O(H)=9$ then $i_H(G)=$ _____

(a) 4 (b) 9 (c) 0 (d) 2

(5) If $a^n = e$, for some positive integer n , then $O(a)$ _____ n

(a) \leq (b) $<$ (c) $=$ (d) \geq

-----X-----X-----X-----