P. S. SCIENCE & H. D. PATEL ARTS COLLEGE, KADI

Internal Examination

B. Sc. Semester - V [Marks - 40

27-9-2016] **Mathematics - 504** [2 Hours

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1. [A] Define lattice with illustration.

   [B] **Attempt any two**

   (1) Define Lattice Isomorphism.
   Prove that lattices $\langle S_6, D\rangle$ and $\langle P(\{a, b\}), \subseteq\rangle$ are isomorphic lattices

   (2) Let $\langle L, \subseteq\rangle$ be a Lattice and let $a, b \in L$.
   Then Prove that $a \leq b \Leftrightarrow a * b = a$

   (3) Let $\langle L, \subseteq\rangle$ be a lattice and let $a,b,c \in L$
   Then prove that $a \oplus (b * c) \leq (a \oplus b) * (a \oplus c)$.

2. [A] Define complemented lattice with illustration

   [B] **Attempt any two.**

   (1) Define Sublattice with illustration.

   (2) Let $\langle L, \subseteq\rangle$ be a lattice and let $a,b,c \in L$
   Then prove that $(a * b) \oplus (a * x) \leq a * [b \oplus (a * c)]$

   (3) Define atom with illustration.

3. [A] Define Boolean Expression with illustration.

   [B] **Attempt any two**

   (1) Define Symmetric Boolean Expression with illustration

   (2) Obtain SOP Canonical form of
   $\alpha(x_1, x_2, x_3) = x_2 \oplus x_3$.

   (3) Obtain POS Canonical form of
   $\alpha(x_1, x_2, x_3) = x_1 \oplus x_2$.
