

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

Internal Examination

B. Sc. Semester - V

[Marks - 40

9-10-2015]

Mathematics - 504

[1-30 to 3-00

1. [A] Define lattice.

Let $\langle L, \leq \rangle$ be a Lattice in which $*$ and \oplus denote the Operations of meet and join resp. Then P. T. $\forall a, b \in L$,
 $a \leq b \Leftrightarrow a * b = a$

[B] Attempt any two

- (1) P. T. $\langle S_{30}, D \rangle$ and $\langle P(\{a, b, c\}), 0 \rangle$. Lattices are isomorphic
- (2) Define Lattice Homomorphism with illustration.
- (3) Define lattice Isomorphism with illustration.

2. [A] Define complemented lattice with illustration

[B] Attempt any two.

- (1) Define Boolean Algebra with illustration
- (2) Define Atom. P. T. $(a * b)' = a' \oplus b'$
- (3) Let $\langle B, *, \oplus, ', 0, 1 \rangle$ be a Boolean Algebra
If $x_1 \leq x_2$ then P.T. $A(x_1) \subset A(x_2)$

3. [A] Define Boolean Expression with illustration.

[B] Attempt any two

- (1) Define maxterm Find the value of
$$\alpha(x_1, x_2, x_3) = x_1 * x_2 * [(x_1 * x_4) \oplus x_2' (x_3 * x_4)']$$
for $x_1 = 2, x_2 = 6 = x_4, x_3 = 3$.
Over the Boolean algebra $\langle S_6, D \rangle$
- (2) Define minterm. Express Boolean expression
$$\alpha(x_1, x_2, x_3) = x_1 * (x_2 \oplus x_3 * x_4')$$
as a SOP Canonical form.
- (3) Explain Cube carry method for minimization of Boolean expression with illustration.