

7. Let S be a non empty set and $*$ be a binary operation on S . The algebraic system $(S, *)$ is called a ___if the operation $*$ is associative. CO4- R
- (a) Group (b) Semigroup (c) Monoid (d) Abelian
8. A subgroup $(H,*)$ of $(G,*)$ is called a _____if for any $a \in G$, $aH=Ha$ CO4- R
- (a) Group (b) Normal subgroup (c) Abelian group (d) Cyclic group
9. The complemented, distributive lattice is a CO5- R
- (a) Boolean algebra (b) Distributive (c) Lattice (d) Sub lattice
10. $a \bullet b + a \bullet b' =$ CO5- R
- (a) a (b) b (c) a' (d) b'

PART – B (3 x 8= 24 Marks)

(Answer any three of the following questions)

11. Obtain the PCNF and PDNF of $(P \wedge Q) \vee (\neg P \wedge R)$ CO1- Ana (8)
12. Find the number of integers between 1 and 500 that are not divisible by any of the integers 2, 3, 5 & 7. CO2- App (8)
13. Prove that in a simple graph with n vertices and k components cannot have more than $\frac{(n-k)(n-k+1)}{2}$ edges. CO3- Ana (8)
14. Show that $(Q^+, *)$ is an abelian group where $*$ is defined by $a * b = \frac{ab}{2}, \forall a, b \in Q^+$ CO4- Ana (8)
15. Let $D_{30} = \{1,2,3,5,6,10,15,30\}$ and let the relation R be divisor on D_{30} . CO5- App (8)
- Find (a) all the lower bounds of 10 and 15.
 (b) the glb of 10 and 15.
 (c) all upper bounds of 10 and 15.
 (d) the lub of 10 and 15.
 (e) draw the Hasse diagram.