

**Fourth Semester B.Sc. IT
Examination Aug/Sep-2015**

Mathematics-II

Time:-3Hours

Max. Marks: - 75

SECTION-A

Answer any five questions.

(5*5)

1. What do you understand by Algebra of sets?
2. In a survey of 30 students 15 have taken Economics, 10 have taken Economics but not History. Find the number of students who have taken Economics and History. Also find who have taken History but not Economics.
3. If the function $f: \mathbb{Q} \longrightarrow \mathbb{Q}$ be defined by,
$$f(x) = x^2$$
; then find $f^{-1}(36)$ and $f^{-1}(6)$.
4. Give two examples of Posets for which Supremum and Infimum exist for every pair of element.
5. Define Directed Graph and Undirected Graphs with the help of diagrams.
6. Prove that the Chromatic number of a graph consisting of one circuit with $n \geq 3$ vertices is 2 if n is even and 3 if n is odd.
7. Write a brief note on Venn- Diagrams.

SECTION-B

Answer any two questions.

(10*2)

8. Discuss the various theorems on Lattices.
9. Write a detail note on the following:
 - i. Eulerian Graph
 - ii. Hamiltonian Graph
10. With the help of truth tables, prove the following:
 - i. $\sim P \vee \sim q = \sim (P \wedge Q)$
 - ii. $\sim (P \wedge q) = (\sim P \wedge \sim q)$

SECTION-C

Answer any two questions.

(15*2)

11. What do you understand by validity of Argument? How the validity of an agreement can be tested? Also discuss various fundamental rules to test the validity.

12. (i) Let $R = \{(1, 2), (2,3), (3,4)\}$ on the set $A = \{1,2,3,4\}$. Find the reflexive, symmetric and transitive closure by using graphical method.

13. Find the reflexive, symmetric and transitive closure for the relation:

$R = \{(1,2), (2,3), (3,4), (2,1)\}$ on $A = \{1,2,3,4\}$ by graphical method.