

**SCHOOL OF ADVANCED SCIENCES**

**Mid Semester Exam**

**M.TECH. – II Semester**

**MATHEMATICAL FOUNDATIONS OF COMPUTER SCIENCE**

**Course: MAT513 Time : Two Hours Max. Marks: 50**

**PART-A (4\*5=20 Marks)**

**Answer ANY FOUR questions**

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| 1. Find the number of paths of length between two different vertices in if is:   1. 3 b) 4 |
| 2. Draw a complete 3-ary tree of height 3 and hence, determine the number of vertices and the number of leaves in a complete m-ary tree of height . |
| 3. Which of the following relations on are partial orderings? If any of these relations is not a partial ordering, determine the properties of partial ordering that the relation lacks? |
| The Boolean operator, called the XOR operator, is defined as:  11 = 0, 1 0 = 1, 0 1 = 1, 0 0 = 0.  4. Using a Boolean table, show that the following Boolean identities hold: |

**PART-B (3\*10=30 Marks)**

**Answer ANY THREE questions**

1. (a) How many persons have the same month of birth among 150 persons ?

(b) How many passwords can generated of length 5 using different digits from

0,1,2, 3,4,5,6,7,8 and 9 (with repetitions) ?

1. Which of the following relations from R -> R are functions. Why or Why not ? (a) y = 3x+2 (b) y = √x and (c) y = 2x2 + 3.
2. Write the contradiction of (a) (x = 2 or x = 4) (b) (x>3 and (x <10 or x >8)) ?
3. Translate into English the statement  , where the domain for both variables consist of all real numbers.

**\*\*\*\*\*ALL THE BEST \*\*\*\*\***