

Code No: B5701

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

M.TECH II SEMESTER EXAMINATIONS, APRIL/MAY 2012

ALGORITHMS FOR VLSI DESIGN AUTOMATION

(VLSI SYSTEM DESIGN)

Time: 3hours

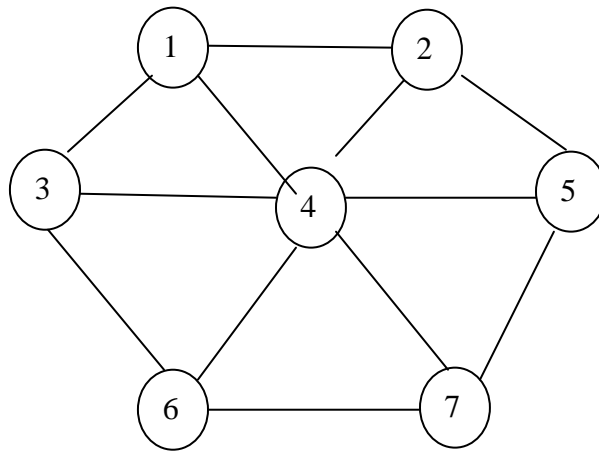
Max.Marks:60

Answer any five questions
All questions carry equal marks

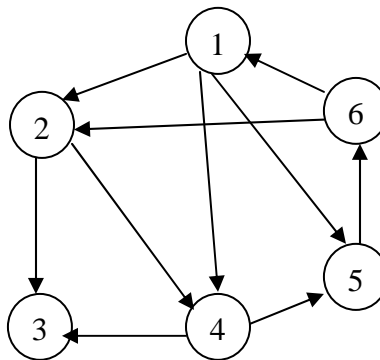
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1. A graph shown below is having the cost of various edges as indicated in the following Table. Explain the procedure for constructing the Minimum cost spanning Tree for the graph and plot the constructed tree.

| | | | | | | | | | | | | |
|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Edge | 1-2 | 1-3 | 1-4 | 2-4 | 2-5 | 3-4 | 3-6 | 4-5 | 4-6 | 4-7 | 5-7 | 6-7 |
| Cost | 5 | 4 | 1 | 12 | 10 | 3 | 6 | 8 | 11 | 9 | 7 | 2 |



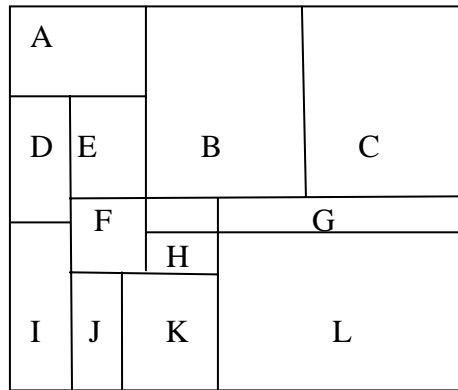
2. Find the shortest path between the nodes 1 and 2 in the following graph.



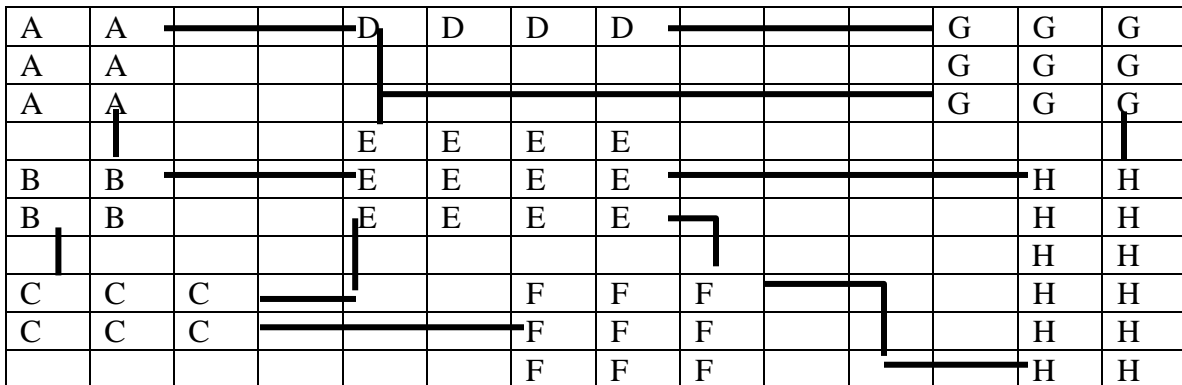
The cost of various edges are indicated in the following Table.

| | | | | | | | | | |
|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Edge | 1-2 | 1-4 | 1-5 | 2-3 | 2-4 | 4-3 | 4-5 | 5-6 | 6-1 |
| Cost | 6 | 1 | 3 | 1 | 2 | 5 | 1 | 1 | 2 |

- 3.a) Explain about the Polar Graph in connection with Floor Planning.
 b) For the following floor planning, plot (i) Polar Horizontal Graph
 (ii) Polar Vertical Graph



4. Explain Horizontal Virtual Grid Compaction algorithm and apply the algorithm to the given layout and give the compacted layout.



In the above layout, the cell “A” is a 3x2 grid. The same applies for the remaining. The bold lines represent the connection between various cells.

5. Explain Maze Running Algorithm to find the shortest path between source and Target in a grid, and apply the algorithm to find the shortest path for the given Grid.

| | | | | | |
|----|---|---|----|----|----|
| | 1 | 2 | 3 | 4 | 5 |
| 1 | S | 1 | X | 5 | 6 |
| 2 | 1 | 2 | X | 6 | 7 |
| X | X | 3 | 4 | 5 | 6 |
| 6 | 5 | 4 | 5 | 6 | 7 |
| 7 | 6 | X | X | X | 8 |
| 8 | 7 | X | | 10 | 9 |
| 9 | 8 | 9 | 10 | | 10 |
| 10 | 9 | T | | | |

Each integer represents the cost and S & T are source and Target respectively and "X" represents obstacle.

6. Explain about various Binary Decision Diagrams with an example for each.
7. Write about various MCM routing Algorithms.
8. Construct the Horizontal Constraint Graph and Vertical Constraint Graph for the following given Routing Problem.

