*Seat No.: _____* *Enrolment No._____*

# GUJARAT TECHNOLOGICAL UNIVERSITY

**M. E. - SEMESTER – I • EXAMINATION – WINTER • 2013**

**Subject code: 714202N** **Date: 26-12-2013**

**Subject Name: Applied Algorithm for VLSI CAD**

**Time: 10.30 am – 01.00 pm** **Total Marks: 70**

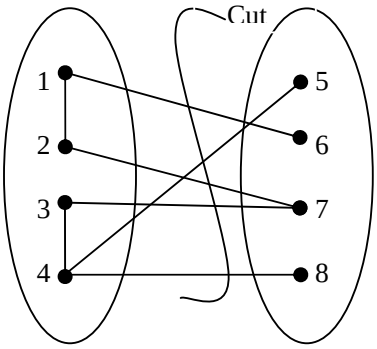
## Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full mark.**

**Q.1** **(a)** With reference to Graph Theory define the following terms. **07**

(1) Mixed Graph (2) Adjacent Nodes (3) Loop
(4) Isolated Node (5) Degree of Node
(6) Strong Component (7) Simple Path

**(b)** Solve the Following example by using K-L Algorithm. **07**




**Q.2** **(a)** State and prove the Theorem 1 and Theorem 2 for Graph Theory. **07**

**(b)** Explain the different objectives and constraints of Routing **07**

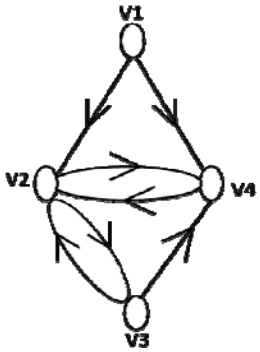
**OR**

**(b)** Explain the following terms with respect to Floor planning. **07**

(1) Rectangular Dissection (2) Slicing Structure (3) Slicing Tree.

**Q.3** **(a)** List down the different Layout Styles. Explain any two in detail. **07**

**(b)** Find the Adjacency Matrix (A) for the following Graph. Also find out the in degree and out degree of each node by using Transpose ($A^T$) of the A. **07**

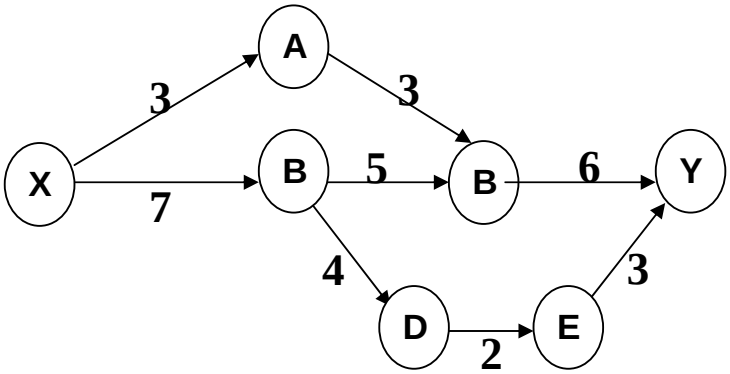



**OR**

**Q.3** **(a)** Explain Hadlock's algorithm. **07**

**(b)** Explain the principal Difference and similarities between Kernighan-Lin and Fiduccia-Mattheyses Heuristics. **07**

**Q.4** **(a)** For given network find the maximum flow using Ford Fulkerson Algorithm. **07**




**(b)** Explain the Global Routing by Simulated Annealing. **07**

**OR**

**Q.4** **(a)** What are the major drawbacks of Lee's Algorithm and how Line Search Algorithm differs from it? **07**

**Q.4** **(b)** Explain The following terms. **07**

(1) Polynomial-time algorithm. (2) Space Complexity. (3) Net.
(3) Time Complexity. (5) NP-complete problem (6) Pin
(7) Base Cell.

**Q.5** **(a)** Explain the Polar and Channel intersection graph in floor planning. **07**

**(b)** Discuss the various Cost Function and Constraints for Placement. **07**

**OR**

**Q.5** **(a)** Explain the basic Left-Edge Algorithm for Channel Routing. **07**

**(b)** Compare Genetic Algorithm with Conventional Algorithms. **07**

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