

**GUJARAT TECHNOLOGICAL UNIVERSITY**  
**M. E. - SEMESTER – I • EXAMINATION – WINTER 2012**

Subject code: 714202N

Date: 09-01-2013

Subject Name: Applied Algorithm for VLSI CAD.

Time: 02.30 pm – 05.00 pm

Total Marks: 70

**Instructions:**

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

- Q.1** (a) Define the following terms. **07**
- i. Hard Problem.
  - ii. Net.
  - iii. Cell.
  - iv. Pin.
  - v. Big-Omega Notation.
- (b) Describe Spanning Tree. Find out all the possible Spanning Trees for the graph given in figure 1. **07**

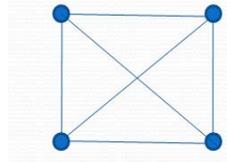


Figure 1.

- Q.2** (a) Explain the following terms with respect to Graph Theory. **07**
- i. Graph.
  - ii. Multi Graph.
  - iii. Sub Graph.
  - iv. Degree of Vertex.
  - v. Tree.
- (b) State and explain the Depth First Search (DFS) Algorithm. Find out the solution for the graph given in figure 2 by using DFS. **07**

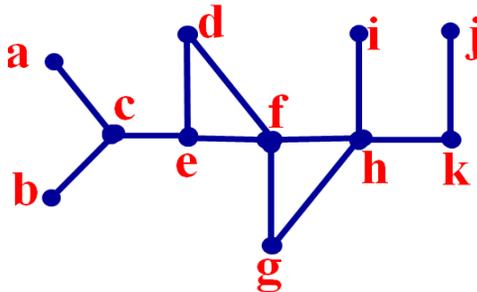


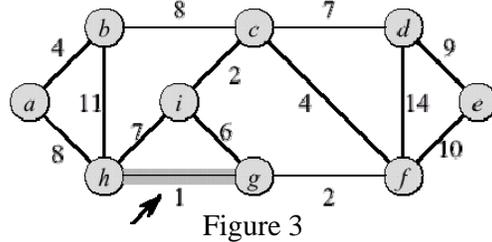
Figure 2

**OR**

- (b) Compare the Conventional Algorithms with Genetic Algorithms. **07**
- Q.3** (a) List the different Global Routing approaches. Discuss any one in detail. **07**
- (b) What is channel routing? Explain the classical model of channel routing. **07**

**OR**

- Q.3** (a) What is adjacency matrix and path matrix? Explain with suitable examples. **07**  
(b) State and explain the Kruskal algorithm. Find the solution for the graph given in figure 3 by using Kruskal algorithm. **07**



- Q.4** (a) Explain the application of Simulated Annealing in Partitioning. What is the importance of Simulated Annealing in VLSI Circuit Design? **07**  
(b) Explain the following terminology with respect to partitioning. **07**  
i. Balance Criterion.  
ii. Cut State of Partitioning.  
iii. Base Cell.

**OR**

- Q.4** (a) What are the advantages and disadvantages of Maze Routing and Line Search Routing? **07**  
**Q.4** (b) Describe the methods used to reduce the running time in Lee Algorithm. **07**  
**Q.5** (a) Discussed about Constructive Algorithms and Iterative Algorithms. **07**  
(b) Describe the wire length estimation techniques in detail. **07**

**OR**

- Q.5** (a) Give the comparison between Placement and Floorplanning. **07**  
(b) List down the different Approaches of Floorplanning. Discuss each in brief. **07**