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Question Paper Code : 71871

M.E. DEGREE EXAMINATION, JUNE/JULY 2013.

Second Semester

VLSI Design

VL 9221/VL 921 — CAD FOR VLSI CIRCUITS

(Common to M.E. – Applied Electronics, M.E. – VLSI Design,
M.E. Embedded Systems, and M.E. Digital Electronics and
Communication Engineering)

(Regulation 2009)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

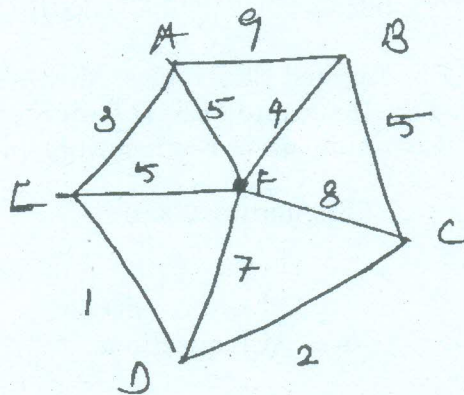
1. What is simulated annealing? What is its significance?
2. There are three different types of problems faced at the level of Boolean gates. Name them.
3. Write the values that govern the minimum distance calculation.
4. Perturbation of a feasible solution for standard cell or building block placement is more complex. Why?
5. How do you select the floor plan order?
6. List the parameters that characterize the types of local routing problem.
7. What are the software modules used for the construction of a simulator?
8. How can ROBDD be used in logic verification?
9. Show a chart that performs the transition of a high level synthesis.
10. Draw the data flow graph for the given program fragment
While ($a > b$)
 $a \leftarrow a - b$;

PART B — (5 × 16 = 80 marks)

11. (a) Consider the shortest path problem for directed graphs in which the length of a path is the number of edges in the path. It can be solved by breadth-first search method. What actions should be performed by the functions that “process” a vertex and an edge in order to actually compute the shortest path from any start vertex V_s to all other vertices in the graph?

Or

- (b) Write the pseudo code of an algorithm for an exhaustive search by means of back-tracking for the following travelling salesman problem, obtain the search tree.



12. (a) Name the algorithm proposed by Liao-Wong. Give out its distance evolution graph with the pseudo code.

Or

- (b) Write the steps involved in the application of Kernighan-Lin algorithm. How does it perform the partitioning? Elaborate.

13. (a) Consider the floor plan that consists of four leaf cells. A, B, C and D. The leaf cells are inset cells that can be rotated and mirrored. Their dimensions are,

A : 2×2

B : 1×3

C : 1×4

D : 2×4 .

Give the shape functions of these cells. Compute the optimal shape of the circuit by applying the sizing algorithm using the slicing tree.

Or

- (b) Why do we say that the channel routing problem is NP-Complete? With an example, explain the rotast channel routing algorithm and give out its results.

14. (a) What is compiler driven simulation? How does it overcome the issues raised by gate level simulation models? Differentiate it from event-driven simulation.

Or

- (b) Write down the transformation involved in the side reduction of an OBDD into ROBDD. Also implement and construct ROBDD.
15. (a) (i) Mention the problems investigated in optimization of function at high level synthesis. (6)
- (ii) What is simple mobility based scheduling algorithm? Support your answer with a pseudo code. Explain. (10)

Or

- (b) (i) How does the interval and circular-arc graph coloring method perform the assignment? Discuss with a sample set of circular arcs. (12)
- (ii) How does an input algorithm represent the internal hardware synthesis? (4)
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