

CBCS SCHEME



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20EVE31

Third Semester M.Tech. Degree Examination, Feb./Mar. 2022

CAD of Digital Systems

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. Explain the different types of design entities in VLSI design. (08 Marks)
- b. Discuss the domains and their hierarchies in VLSI design with Y chart. (08 Marks)
- c. Explain the different types of problems in logic synthesis. (04 Marks)

OR

- 2 a. Explain the verification methods of checking the correctness of an integrated circuit. (06 Marks)
- b. Explain the pseudo-code description of Dijkstra's shortest path algorithm. (06 Marks)
- c. Explain P, NP and NPC classes of decision problems in the field of complexity theory. (08 Marks)

Module-2

- 3 a. Write a pseudo-code description for genetic algorithm and explain. (06 Marks)
- b. With neat sketch explain minimum-distance design rules on Lambda-Grid. (08 Marks)
- c. Write and explain the pseudo-code of branch and bound algorithm. (06 Marks)

OR

- 4 a. Write and explain the pseudo-code for simulated annealing. Discuss the application in VLSI design with pros and cons. (10 Marks)
- b. Describe briefly VLSI design problem formulation with respect to compaction. Informal and graph theoretical formulation and maximum distance constraints with necessary equations. (10 Marks)

Module-3

- 5 a. Draw the representation of RS Latch in various graphical models and explain their relevance. (10 Marks)
- b. Write and explain the pseudo-code description of the Kernighan-Lin algorithm for partitioning. (10 Marks)

OR

- 6 a. Explain the various optimization problems related to floor planning and discuss briefly sizing algorithm for slicing floor plans. (10 Marks)
- b. Explain the different types of placement algorithm with the help of neat sketches. (10 Marks)

Module-4

- 7 a. Discuss the various parameters which defines the local routing problems and explain channel routing models. (10 Marks)
- b. Explain the global routing and standard cell layout. (06 Marks)
- c. Discuss briefly the channel routing. (04 Marks)

OR

- 8 a. Explain in detail important abstraction levels and the softwares models in simulation. (10 Marks)
b. Discuss in detail the important issues related gate – level modeling. (10 Marks)

Module-5

- 9 a. Write and explain pseudo – code of data structure for an ROBDD vertex. (08 Marks)
b. What are the two different types of variable ordering methods which defines transformation reduces in ROBDD siz. Draw the relevant figures. (12 Marks)

OR

- 10 a. Draw the DFG for the program $x = a * b$, $y = c + d$, $z = x + y$ and different stages of its execution and explain the steps. (10 Marks)
b. Draw and explain two different DFGs of the program fragment
If ($a > b$)
 $c \leftarrow a - b$;
 else
 $c \leftarrow b - a$;

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