

USN

--	--	--	--	--	--	--	--	--	--

14EVE41

Fourth Semester M.Tech. Degree Examination, June/July 2016 Synthesis and Optimization of Digital Circuits

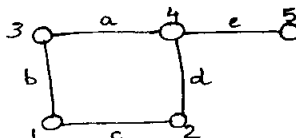
Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions.

1. a. Briefly explain on the architectural level, logic level and geometrical level synthesis with relevant figures. (10 Marks)
- b. With necessary diagrams and notations discuss on directed and undirected graphs. (10 Marks)
2. a. Give the structural and behavioural representation of Half Adder in VHDL. (05 Marks)
- b. For a function $f = (ab + bc + ac)$, find the Boolean difference, consensus and smoothing with respect to a. (10 Marks)
- c. For the graph in figure, find the minimum vertex cover. (05 Marks)

Fig.Q2(c)



3. a. Write the Dijkstra algorithm. (06 Marks)
- b. Compare the different hardware description languages used for synthesis. (08 Marks)
- c. Explain the following abstract models : (06 Marks)
 - i) Structures
 - ii) Logic Networks.
4. a. What do you mean by tautology? Find if the function $f = ab + ac + a'$ is a tautology. (08 Marks)
- b. Explain the following operators for logic minimization : (08 Marks)
 - i) Expand
 - ii) Reduce
 - iii) Irredundant
 - iv) Essentials.
- c. Explain ATPG. (04 Marks)
5. a. With suitable example, explain the rule based system for logic optimization. (10 Marks)
- b. Write the pseudocode for the ASAP and ALAP scheduling algorithm. (10 Marks)
6. a. With neat diagrams, explain the different types of finite state machine decompositions. (08 Marks)
- b. Discuss on Don't care conditions in synchronous networks. Also define input controllability, output observability and internal observability. (12 Marks)
7. a. Explain Loop folding with an example. (08 Marks)
- b. Explain the rule – based library binding. Compare the algorithmic and rule – based binding approaches. (12 Marks)
8. Write short notes on : (20 Marks)
 - a. ILP model for scheduling.
 - b. LUT FPGA.
 - c. Microelectronic Design Style.
 - d. Hu's Algorithm.

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and/or equations written eg, 42+8 = 50, will be treated as malpractice.