

# BE (IT) Part IV 7<sup>th</sup> Semester Examination, 2012

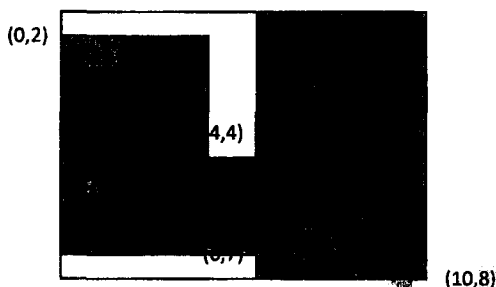
## IT 705/1: CAD for VLSI

Answer any SEVEN.

FM: 70

Time: 3 Hrs

1. How can you realize a chip design problem from physical domain? Explain. "In DSM regime, VLSI physical design problem has become interconnect centric". Justify.  
5+5
2. What are the primary challenges in advanced digital design today? How many types of signals can you find in a VLSI circuit? How do the phases in layout design find importance in clock synchronization problem today?  
3+2+5
3. What is the role of technology mapping during logic synthesis? What is the purpose of using feedthrough in standard cell based design? What are primary advantages of FPGA based design over ASIC?  
3+2+5
4. What is Grid routing? What are the different algorithms used for grid routing? Explain different steps in Lee's algorithm for maze routing. What is the space complexity of this algorithm? Mention different improvements for this.  
1+2+4+1+2
5. What are the inputs, requirements, and objectives of the placement problem? How the problem varies at different levels of design? What different modeling techniques are used for wire length estimation of multi-terminal nets during placement? Clearly explain with neat diagram.  
4+3+3
6. Explain the grid graph model with a clear example. What is optical proximity correction? How does it help in layout designing?  
5+2+3
7. Classify different types of partitioning algorithms. Explain how the global optima can be achieved by using simulated annealing during partitioning?  
4+6
8. Consider the following figure.



- a. Consider the above placement of three blocks A, B and C. Compute
  - i. Center to center Euclidean wirelength
  - ii. Center to center HPWL
  - iii. % of deadspace
- b. Clearly mention the difference between floorplanning and placement problem.

6+4

9. In MILP formulation of the floorplanning problem clearly mention
- i. Non-overlapping constraints for fixed blocks
  - ii. How can you define Integer variables
  - iii. A general problem formulation

3+3+4

10. Write short notes on any two.

- a. Full Custom Design Style
- b. Role of Design Rules in Layout Design.
- c. Application of Simulation Based methods in placement.

5+5