Roll No .....

# EC - 705

## B.E. VII Semester



Examination, December 2015



## VLSI Design

***Time : Three Hours***

***Maximum Marks : 70***

***Note:*** i) Answer five questions. In each question part A, B, C is compulsory and D part has internal choice.
ii) All parts of each question are to be attempted at one place.
iii) All questions carry equal marks, out of which part A and B (Max. 50 words) carry 2 marks, part C (Max. 100 words) carry 3 marks, part D (Max. 400 words) carry 7 marks.
iv) Except numericals, Derivation, Design and Drawing etc.

1. a) Write down all the steps of IC production process.
   b) Write any five differences between the Bipolar technology and Hybrid Technology.
   c) Give a brief discussion about the size and complexity of Integrated circuits.
   d) "Microelectronics Field plays a vital role in VLSI designing" Prove this statement with the help of a suitable example.

   OR

   Describe the various rules and process parameters of VLSI.

2. a) Explain the operating principle of MOS Transistor at DC and low frequency.
   b) Explain high frequency MOSFET Model.
   c) How the circuits and signals get affected by changing the circuit from low frequency to high frequency?. Explain.
   d) Draw and explain all the MOSFET Models for digital applications with the help of a suitable diagram.

   OR

   Derive a relation for the Sub threshold operations. How we can implement this operation on short channel devices?





3. a) Explain the principle of circuit simulation in VLSI designing.
   b) How simulation does affect I the circuit by using SPICE? Explain.
   c) Discuss about the large signal diode current and explain it with the help of a suitable example.
   d) Derive a relation for Temperature Dependence of the BJT. Use this expression to solve any one modeling operation.

   OR

   Explain Level 2 Large Signal Model and compare it with the high frequency model.

4. a) Discuss the principle of Quasi Static register Cells.
   b) Write differences between Random Logic and Structured Logic forms.
   c) Draw and explain the circuit of Motorola 6800 microprocessor register cell.
   d) What do you mean by Systolic Arrays? Explain its Multiplication Process and general linear system solver mechanism.

   OR

   Explain the principle of Micro coded controllers. Give any one practical application.

5. a) Explain the principle of Latch up.
   b) Discuss about the Twin tub process and its disadvantages in fabrication technique.
   c) Discuss about Latch up's physical origin, its triggering and its prevention methods.
   d) Write short notes :
   (i) Algotronix (ii) NMOS Process

   OR

   (i) BJT Noise Model (ii) Interconnects

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