

Answer any **FIVE** Questions

All Questions carry **equal** marks

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1. (a) What are the types of major processes used in IC fabrication?  
(b) Mention any four advantages of VLSI.  
(c) Mention the design flow in VLSI process.

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2. (a) Explain clearly about the latch-up effects in p-well structure with the help of a neat circuit diagrams.  
(b) Mention remedies for this effect.

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3. Explain lamda based design rules.

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4. Derive an equation for the propagation delay from input to output of the pass transistor chain shown in figure.

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5. (a) Design logic for an ALU that can perform both logical and arithmetic operations.  
(b) Enumerate all the 16 possible functions of a two input ALU.

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6. What are the various design options used to implement the CMOS system design explain each in detail?

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7. Write a program in VHDL for an 8:1 multiplexer in behavioral and structural style and compare them.

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8. (a) Through comparison explain the manufacturing tests and functionality tests.  
(b) Mention how many test vectors are required to exhaustively test a combinational circuit with n-inputs and a sequential circuit with n-inputs and m-storage devices respectively.