

Seat No.

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मुख - 015

Advanced VLSI Design (1020)

P. Pages : 2

Time : Three Hours

Max. Marks : 100

Instructions to Candidates :

1. Do not write anything on question paper except Seat No.
2. Answersheet should be written with blue ink only. Graph or diagram should be drawn with the same pen being used for writing paper or black HB pencil.
3. Students should note, no supplement will be provided.
4. Attempt **any five**. Each question carries equal marks.
5. Draw well labelled diagram and assume suitable data whenever necessary.

1. a) Write down the VHDL code for 8:1 Mux. Also write the test bench for it
b) Explain synthesizable and non-synthesizable statement in VHDL with examples.
2. a) What is level of abstraction ? Explain different levels of abstraction.
b) Explain full custom and Semi-Custom ASIC with schematic.
3. a) What is routing explain different types of routing in detail.
b) Write features & specifications of FPGA in detail.
4. a) Explain the construction of CMOS transistor and draw the transfer characteristics.
b) What is a compound gate explain the advantages of compound gates over other gates.
5. a) Explain VLSI Design flow with the help of flow chart.
b) Write short notes on :
 - i) Tunneling,
 - ii) Channel length modulation.
6. a) Does the body effect of a process limit the number of transistor that can be placed in series in CMOS gate at low frequencies ?

- b) Draw the CMOS compound gate for the function $Y = (A + B)(C \cdot D)$ and explain with truth table.
7. a) Write short notes on:
- Static and dynamic characteristics.
 - Power consumption in MOS.
- b) Explain the formation of depletion region and inversion layer in n channel enhancement type MOSFET.
8. a) Draw and explain 2:1 Mux Inverter using transmission gates, also explain its advantages over other gates.
- b) Explain different methods of resistance and capacitance estimation techniques.
