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BACHELOR OF TECHNOLOGY (C.B.C.S.) (2014 COURSE)
B.Tech.Sem - VI E & TC : WINTER- 2022
SUBJECT : VLSI DESIGN

Day : Monday

Time : 10:00 AM-01:00 PM

Date : 28-11-2022

W-13363-2022

Max. Marks : 60

N. B. :

- 1) All questions are **COMPULSORY**.
 - 2) Figures to the right indicate **FULL** marks.
 - 3) Draw neat and labelled diagrams **WHEREVER** necessary.
 - 4) Assume suitable data, if necessary.
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Q. 1 a) Why layout design rules are used? Discuss lambda and micron design rules. (04)

b) Draw stick diagram and CMOS based circuit diagram for 2-input NOR. (06)

OR

Q. 1 a) Describe VLSI design flow. (04)

b) How will you define semi-custom and full-custom VLSI design flow? (06)

Q. 2 Using suitable equations, explain MOSFET C-V characteristics. (10)

OR

Q. 2 Using suitable waveforms, explain τ_{fall} , τ_{rise} , τ_{PHL} , and τ_{PLH} for an inverter. (10)

Q. 3 a) Which are the data types available in VHDL? Explain using suitable examples. (04)

b) Write VHDL code for 4-bit down counter. (06)

OR

Q. 3 a) What are the VHDL objects? Explain using suitable examples. (06)

b) Write VHDL code for 3×8 Decoder using when-else statement. (04)

Q. 4 What is Moore FSM? Design 4-bit up counter using Moore FSM. (10)

OR

Q. 4 a) Explain CPLD architecture. (04)

b) Design state machine diagram for a sequence detector "1011". Write VHDL code for the same. (06)

Q. 5 What is the need of low power VLSI design? How power is consumed in CMOS VLSI design? (10)

OR

Q. 5 How switched capacitance is reduced? (10)

Q. 6 What is Adhoc-DFT? How it is implemented? (10)

OR

Q. 6 What is scan based design? How is it implemented? (10)

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