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Total No. of Pages : 02

Total No. of Questions : 09

B.Tech. (CSE / IT) (Sem.-7,8)

DIGITAL SYSTEM DESIGN

Subject Code : BTEC-302-18

M.Code : 90689

Date of Examination : 02-01-2023

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1. Write briefly :

- a) Differentiate between combinational and sequential circuits.
- b) State De-Morgan's theorem.
- c) Describe the significance of pseudo random binary sequence generator.
- d) What is race around condition in JK flip flop?
- e) Why the input variables to a PAL are buffered?
- f) What is an entity? Write entity for full adder.
- g) What is meant by universal shift register? Explain.
- h) A five-bit DAC produces $V_{out}=0.5V$ for a digital input of 00011. Find the value of V_{out} for an input of 11011.
- i) Explain sub-type for any data type with an example.
- j) Describe the significance of process statement.

SECTION-B

2. Design and explain a Full Adder using Half Adders and truth table.
3. Explain the working of Master Slave JK flip flop using circuit diagram.
4. Draw the circuit of TTL NAND gate and explain its operation. Compare the TTL and ECL logic families.
5. Explain the working of R - 2R ladder type D/A converter.
6. Write a VHDL code for full subtractor using dataflow modelling style

SECTION-C

7. Design a counter with the following repeated binary sequenced, 1, 2, 3, 4, 5, 6 by using JK Flip-flop.
8. Simplify the following Boolean functions by using K-map in SOP & POS.

$$F(w, x, y, z) = \sum m(1, 3, 4, 6, 9, 11, 12, 14)$$

9. Design 8×1 MUX using two $4:1$ MUX and one $2:1$ MUX along with its diagram. Implement 8×1 multiplexer in VHDL using structural modeling style.

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.