S.No. : 47 BCS 2303

No. of Printed Pages : 05

Following Paper ID and Roll No. to be filled in your Answer Book.

PAPER ID : 23205 Roll No. | | | | | | | | | | |

B. Tech. Examination 2019-2020

(Odd Semester)

DIGITAL LOGIC DESIGN

Time : Three Hours] *[Maximum Marks : 60*

Note :– Attempt all questions.

SECTION–A

1. Attempt all parts of the following : $1 \times 8 = 8$

   (a) Subtract following unsigned number using 2's complement :

   (i) 11011 - 11001

   (ii) 101010 - 101011

   (b) Define weighted and unweighted codes with example.

   (c) Why 2's complement representation is used in real life?

[P. T. O.

(d) Draw a digital circuit of 2, two bit binary multipier.

(e) Differentiate between latch and flip-flop.

(f) Explain races in asynchronous sequential circuit.

(g) Differentiate between moore and Mealy machines.

(h) Define fundamental mode operation.

SECTION – B

2. Attempt any two parts of the following : $6 \times 2 = 12$

(a) Represent following number in IEEE single and double precision format :

(i) $(105.625)_{10}$

(ii) $(-23.25)_{10}$

(b) What is lookahead carry adder? Discuss its advantage and disadvantage. Design lookahead carry adder and draw the circut for it.

(c) A sequential circuit with 2 Dff A and B two inputs x and y and output z is specified by the following next state and output equation :

$$A(t+1) = X'Y + XA$$

$$B(t+1) = X'B + XA$$

$$Z = B$$

Draw the logic diagram, list state table and state diagram of the circuit.

(d) Differentiate between PAL and PLA implement following boolean function using PLA.

$$F_1 = AB' + AC + A'BC'$$

$$F_2 = (AC + BC)'$$

SECTION – C

Note:- Attempt all questions. Attempt two parts from each questions. $8 \times 5 = 40$

3. (a) The Hamming code 101101101 is received with even parity correct errors if any.

(b) What is Universal gates? Realize OR gate using NAND gate only.

(c) Minimize following four variable boolean function using K map.

$$F(A, B, C, D) = \sum m(4, 5, 6, 7, 8, 12) + \sum d(0, 1, 2, 3, 9, 11, 14)$$

4. (a) Design Decimal Odder.

   (b) What is encoder? Design Octal to Binar encoder. Also explain priority encoder in detai

   (c) Design 4 x 1 multiplexer. Implement followin boolean expression using 8 x 1 MUX.

$$F(A, B, C, D) = \sum m(0, 1, 3, 4, 8, 9, 15)$$

5. (a) What is race around condition in J-K flip-Flo How to resolve it?

   (b) What do you understand by registers. Explai classification of register in detail with logi circuit.

   (c) Design 4- bit ripple counter using suitable wav form.

6. (a) What do you understand by Hazards? Explain i detail.

   (b) An asynchronous sequential circuit is describe by the excitation and output functions.

$$Y = X_1 X_2^1 + (x_1 + x_2^1)\, y$$

$$z = y$$

(i) Draw the logic diagram of the circuit.

(ii) Derive the transition table and output map.

(iii) Obtain flow table.

(c) What is VHDL? Write VHDL code for traffic light controller.

⌘⌘⌘