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BE (3rd Semester)

Examination, April-May 2021

Branch : CSE, IT, Mechatronics

DIGITAL ELECTRONICS & LOGIC DESIGN

Time Allowed : Three Hours

Maximum Marks : 80

Minimum Pass Marks : 28

Note : Part (a) is compulsory. Attempt any two parts

from (b), (c) and (d).

Q. 1. (a) (i) Convert a gray code 1001 1011 into

binary.   1

(ii) Convert $(3C9A)_{16}$ into decimal.   1

(b) Simplify the following Boolean function by using Quine McCluskey method. **7**

$$f(A, B, C, D) = \Sigma m(0, 1, 2, 8, 10, 11, 14, 15)$$

(c) Simplify following Bollean function using K-map also draw the logic gate circuit. **7**

$$f(A, B, C, D) = \Sigma m(0, 2, 3, 5, 6, 7, 8, 9)$$

$$+ d(10, 11, 12, 13, 14, 15)$$

(d) Simplify Boolean function in sum of product.

(i) $(X+Z)(Z\bar{Y}+XZ)(\bar{X}Z+\bar{Y})$ **4**

(ii) $[A\bar{B}(C+BD)+\bar{A}\bar{B}]C$ **3**

Q. 2. (a) Explain Demux. **2**

(b) Design a BCD to Excess 3 code converter using AND, OR, EXOR. **7**

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(c) Implement the following Boolean function using 4 : 1 MUX. **7**

$$f(A, B, C, D) = \Sigma m\ (0,1,\ 2,\ 4,\ 6,\ 9,\ 12,\ 14)$$

(d) Explain BCD adder with diagram. **7**

Q. 3. (a) What do you mean by flip flop ? **2**

(b) Convert SR FF into JK. Also draw logic diagram. **7**

(c) Draw the circuit of RTL using NOR gate & explain it. **7**

(d) Explain race around condition in JK F/F. Suggest a suitable modification in JK F/F to overcome this problem. **7**

Q. 4. (a) Write two applications of shift register. **2**

(b) Explain shift register with its classifications. **7**

(c) Design divide by 6 counter using T F/F. Write state table & reduce the expression using K Map. Also draw logic diagram. **7**

(d) Explain ripple counter (2 bit) with logic diagram & timing diagram using JK FF. 7

Q. 5. (a) Difference between RAM & ROM. 2

(b) Discuss the successive approximation method for A/D conversion. 7

(c) Implement the following Boolean function using PLA. 7

$f_1(A, B, C) = \Sigma (0, 1, 3, 4)$

$f_2(A, B, C) = \Sigma (1, 2, 3, 4, 5)$

(d) Explain ROM & draw 8×4 diode matrix ROM with the help of decoder (3×8). 7