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JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT
TEST - 3 EXAMINATION, May 2019

B.Tech IVth Semester (ECE)

Course Code: 10B11EC401
Course Name: Digital Electronics
Course Credits: 04

MAX. MARKS: 35

MAX. TIME: 2 Hrs.

Note: All questions are compulsory. Carrying of mobile phone during examinations will be treated as case of unfair means. Marks are indicated in square brackets against each question

1(a) Implement the following function with 8:1 and 4:1 Multiplexer **[4 Marks]** (CO-1)

$F(x, y, z) = \sum m(0, 2, 3, 5)$

(b) Minimize the following function using a K-map **[3 Marks]**

$F(X_1,X_2,X_3,X_4)=\sum m(1,3,5,7,8,9,12,13) + d(14,15)$

2(a) Convert an SR flip-flop to JK flip-flop. **[4 Marks]** (CO-3)

(b) What do you mean by triggering of flip-flops? Explain briefly the different methods of triggering the flip-flops. **[3 Marks]**

3(a) With the help of suitable diagram explain the working of a universal shift register. **[4 Marks]** (CO-3)

(b) The content of a 4-bit shift register is initially 1101. The register is shifted six times to the right with the serial input having 101101. Write the content of register after each shift. **[3Marks]**

4(a) With the help of suitable diagram explain the working of a BCD Ripple counter. **[4 Marks]** (CO-4)

(b) The contents of a 4-bit Ring Counter and Johnson counter are initially 1000. What will be the contents of each counter after four clock pulses? **[3 Marks]**

5(a) An AP flip-flop has four operations: clear to 0, no change, complement and set to 1, when the inputs A and P are 00, 01, 10 and 11 respectively. **[4 Marks]** (CO-5)

(i) Tabulate the characteristic table (ii) Tabulate the excitation table (iii) Derive the characteristic equation (iv) Convert this flip-flop to D flip-flop.

(b) In context to logic families, explain the following terms: **[3 Marks]** (CO-6)

(i) Noise margin (ii) Figure of Merit (iii) Fan Out

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