Reg. No. : | | | | | | | | | | |

Question Paper Code: 31432

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2016

Third Semester

Electronics and Communication Engineering

01UEC302 - DIGITAL ELECTRONICS AND DESIGN

(Regulation 2013)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 2 = 20 Marks)

1. State De Morgan's theorem.
2. Determine canonical SOP form of the function $Y=AB+ACD$.
3. Write down design procedure for combinational circuits.
4. Why multiplexer is called as data selector.
5. What do you mean by triggering of flip flop?
6. What is a shift register? And its types.?
7. What is RAM?
8. Draw the basic configuration of PLA.
9. Distinguish between synchronous sequential circuit and asynchronous sequential circuit.
10. Define hazards.

PART - B (5 x 16 = 80 Marks)

11. (a) Minimize the given switching function using Quine-Mcclusky method

$f(x_1, x_2, x_3, x_4)= \Sigma(0, 5, 7, 8, 9, 10, 11, 14, 15)$. (16)

Or

(b) Simplify the given Boolean function into (i) Sum of products form (ii) Product of sum form and implement it using basic gates. $F(A, B, C, D)= \Sigma(0, 1, 2, 5, 8, 9, 10)$. (16)

12. (a) Design a 4-bit parallel adder/subtractor and draw the logic diagram. (16)

Or

(b) Design a 4-bit magnitude comparator. (16)

13. (a) Discuss in detail about JK flip flop with its truth table, state diagram and characteristics equation. (16)

Or

(b) Design a MOD-10 synchronous counter using J-K flip flops. Write the excitation table and state table. (16)

14. (a) With neat diagram explain the RAM organization. (16)

Or

(b) Implement the given function using PAL.

A= Em(0, 2, 6, 7, 8, 9, 12, 13),

B= Em(0, 2, 6, 7, 8, 9, 12, 13, 14),

C= Em(1, 3, 4, 6, 10, 12, 13),

D= Em(1, 3, 4, 6, 9, 12, 14). (16)

15. (a) (i) Explain the design procedure involved in synchronous sequential logic circuits. (8)

(ii) Write short notes on (a) State table, (b) State diagram and (c) State equation. (8)

Or

(b) Define races and explain its types and hazards that occur in asynchronous circuits. Discuss a method used for race free assignment with example. (16)