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

Question Paper Code : 27189

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2015.

Third Semester

Electronics and Communication Engineering

EC 6302 — DIGITAL ELECTRONICS

(Common to Mechatronics Engineering and Robotics and Automation Engineering)

(Regulations 2013)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. State De-Morgan's theorem.

2. Express the function $Y = A + \overline{B}C$ in canonical POS.

3. Define Half adder and full adder.

4. What is priority Encoder?

5. What are the classification of sequential circuits?

6. What is edge-triggered flip-flop?

7. What is Read and Write operation?

8. What is programmable logic array? How it differs from ROM?

9. Draw the general model of ASM.

10. What is hazard? Define static 1 hazard.

PART B — (5 × 16 = 80 marks)

11. (a) (i) Minimize the following logic function using K-maps and realize using NAND and NOR gates.

$F(A, B, C, D) = \sum m(1,3,5,8,9,11,15) + d(2,13)$. (10)

(ii) Show that if all the gate in a two — level OR-AND gate network are replaced by NOR gate, the output function does not change. (6)

Or

(b) (i) Realize NOT, OR, AND gates using universal gates. (8)

(ii) Discuss about the basic operation of TTL NAND gate. (8)

12. (a) Explain with neat diagram the function of Binary multiplier

(i) using shift method (8)

(ii) parallel multiplier. (8)

Or

(b) Design a BCD to excess 3 code converter using minimum number of NAND gates. (16)

13. (a) (i) Explain the operation of JK flip-flop with neat diagram. (10)

(ii) Explain the operation of master slave flip flop and show how the race around condition is eliminated. (6)

Or

(b) Explain the operation of synchronous MOD-6 counter. (16)

14. (a) Write the differences between static and dynamic RAM. Draw the circuits of one cell of each and explain its working. (16)

Or

(b) Write notes on :

(i) PAL (8)

(ii) FPGA. (8)

15. (a) Design a asynchronous sequential circuit with 2 inputs T and C. The output attains a value of 1 when T = 1 and c moves from 1 to 0. Otherwise the output is 0. (16)

Or

(b) Explain the different methods of Race Free State assignment. (16)