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Question Paper Code : 91397

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2014.

Third Semester

Electronics and Communication Engineering

EC 2203/EC 34/080290010/10144 EC 304 — DIGITAL ELECTRONICS

(Regulation 2008/2010)

(Common to PTEC 2203 – Digital Electronics for B.E. (Part – Time)
Third Semester – Electronics and Communication Engineering Regulation 2009)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Simplify : $A\bar{B}C + \bar{A}BC$.
2. Write the truth table for EXOR gate.
3. State the function of select inputs of a MUX.
4. Draw the logic circuit of a half subtractor.
5. Mention the advantage of JK - FF over SR - FF.
6. Draw the basic block diagram of sequential circuits.
7. How many address lines are required for a 4K ROM?
8. List the types of PLDs.
9. Compare Mealy and Moore machines.
10. Differentiate between static and dynamic hazards.

PART B — (5 × 16 = 80 marks)

11. (a) (i) Simplify the Boolean function $F = \pi(1,3,5,6,7,10,14,15)$ and realize using NAND gates only. (10)
- (ii) Briefly about the CMOS characteristics. (6)

Or

- (b) (i) Using tabulation method minimize the following function $F = \Sigma(0,1,2,8,9,15,17,21,24,25,27,31)$. (10)
- (ii) Simplify the expression $Y = AB + \overline{AB} \cdot \overline{(\overline{A} \overline{C})}$. (6)

12. (a) (i) Implement the full subtractor using demultiplexer. (6)
- (ii) Draw the circuit of a BCD adder and explain its operation. (10)

Or

- (b) Design a BCD to seven segment decoder. (16)

13. (a) (i) Explain the different methods of triggering FFs. (6)
- (ii) Design a synchronous MOD 12 down counter using JK FFs. (10)

Or

- (b) (i) Explain how to convert serial data to parallel and parallel data to serial using shift registers. (10)
- (ii) Realize D and T FFs using JK FF. (6)

14. (a) (i) Derive the PLA programming table for the combinational circuit that squares a 3 bit number. Minimize the number of product terms. (10)

- (ii) Differentiate between

(1) Static and dynamic memory.

(2) Primary and secondary memory. (6)

Or

- (b) (i) Describe the memory read and memory write operation with timing waveforms. (8)

- (ii) What is FPGA? Explain. (8)

15. (a) (i) What is the significance of state assignment? Explain the different techniques used for state assignment. (8)
- (ii) Design a sequence detector to detect the sequence 101 from 10101. (8)

Or

- (b) (i) Give an account for various hazards that could occur in a asynchronous circuit. With examples explain how they could get eliminated. (8)
- (ii) Write the HDL code for a 4 bit comparator and universal shift register. (8)
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