

DECEMBER 2015

P/ID 17502/PCASB

Time : Three hours

Maximum : 100 marks

PART A — (6 × 5 = 30 marks)

Answer any SIX questions.

1. What do you mean by radix of a number system? With an example how a decimal number. Can be converted into a binary number? Write the first 20 decimal digits in base 3.
2. What is error detection codes? Represent the decimal number 8630 in (a) BCD (b) 2-4-2-1 and (c) Excess-3 code.
3. Implement $F = A(BC + D) + \overline{B}C$ using NAND gates only.
4. What is read only memory? Discuss.
5. What is a flip-flop? Write a short note on clocked RS flip flop.
6. Write short notes on shift registers.
7. What is a scratch pad memory? Discuss.
8. Discuss the different register-transfer operations during fetch cycle.

PART B — (7 × 10 = 70 marks)

Answer any SEVEN questions

9. What is an integrated circuit? Write a short note on different types of integrated circuits.
10. The following Boolean expression :
 $BE + \overline{B}D\overline{E}$ is a simplified version of the expression :
 $\overline{A}BE + BCDE + \overline{B}\overline{C}\overline{D}E + \overline{A}\overline{B}D\overline{E} + \overline{B}\overline{C}D\overline{E}$.
Are there any don't care conditions? If so, what are they?
11. What is a full adder? Discuss the function of a full adder. Show how a full-adder can be converted to a full-subtractor with the addition of one inverter circuit.
12. Design a circuit that compares two 4 bit numbers A and B , to check if they are equal. The circuit has one output x , so that $x = 1$ if $A = B$ and $x = 0$ if A not equal to B .
13. Explain briefly about counters.
14. Give brief notes on processor unit.
15. Compare combinational and sequential circuits. Using T flip-flops, design a counter with the following binary sequence 0, 1, 3, 7, 6, 4 and repeat.

16. Draw the logic diagram of arithmetic logic unit and discuss its function.
 17. With a block diagram discuss the design of a control unit with a PLA.
 18. Explain the following :
 - (a) Instruction and data formats
 - (b) Hardwired control.
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