

Roll No.

BCA-201(O)

B. C. A. (Second Semester)
EXAMINATION, May, 2013

(Old Course)

Paper First

DIGITAL PRINCIPLES AND APPLICATIONS

Time : Three Hours]

[Maximum Marks : 75

Section – A

(Numerical/Analytical/Problematic Questions)

Note : Attempt both questions.

1. Solve the following : 2 each

(a) $(256)_8 = (?)_{16}$

(b) $(11.011)_2 = (?)_{10}$

(c) Simplify to minimum number of literals using Boolean Algebra :

$$A + A' B + A' B'$$

(d) Subtract using 2's complement :

$$1100011 - 1000010$$

(e) Show using truth table the validity of Demorgan's Law :

$$(ABC)' = A' + B' + C'$$

(f) Represent decimal number 8620 in BCD and Excess-3 code.

P. T. O.

2. (a) Simplify the following Boolean function : 4

$F(w, x, y, z) = \Sigma 2, 3, 4, 5, 6, 7, 11, 14, 15$
and implement by means of NOR gate.

- (b) Simplify the Boolean function F together with don't are condition d in S-O-P form : 2

$$F(w, x, y, z) = \Sigma 0, 1, 2, 3, 7, 8, 10$$

$$d(w, x, y, z) = \Sigma 5, 6, 11, 15$$

Section - B

6 each

(Short Answer Type Questions)

Note : Answer any seven out of ten given questions.

3. Design a BCD to excess-3 code converter.
4. Why NAND gate is called universal gate ? Justify.
5. What is ROM ? How will you program a full subtractor using ROM ?
6. Describe memory hierarchy. Describe different properties to consider when comparing different types of memory.
7. What is clock and timer ? What is its use in computer system ?
8. Describe monostable and astable timer.
9. What is A/D converter ? Describe a method for A/D conversion.
10. What is D/A converter ? Describe a method for D/A converter.
11. What is precession and resolution of D/A converter ?
12. Differentiate Digital and Analog Systems.

15 each

(Long Answer Type Questions)

Note : Answer any one question out of given questions.

13. What is a decoder ? Show the logic circuit of 3×8 decoder. Implement full adder using decoder.
14. What is Multiplexer ? Show the design of 4×1 MUX. Implement full adder using Multiplexers.