

Dec 2016

Bachelor of Computer Applications (BCA) Examination III Semester

Digital Computer Electronics

Time 3 Hours] [Max. Marks 50

Note : Attempt all the five questions. All questions carry equal marks.

1. (a) Perform the following subtraction, using 2's complement subtraction method :

(i) $M - N$ (ii) $N - M$ where $M = 10101100$ and $N = 11010101$.

(b) Convert the binary number 1101 010 into following codes :

(i) Gray Code (ii) Excess- 3 Code (iii) BCD.

(c) Convert the following number to their indicated bases : $(58.3)_{10} = (?)_8$ (ii) $(AF3)_{16} = (?)_{10}$

(iii) $(627)_8 = (Mr)_{10}$ (iv) $(82)_{10} = (?)_2$.

2. (a) Explain principle of duality with suitable example.

(b) (i) Simplify the following function using Boolean algebra :

$$f = AD + A'BCD' + A'B'C'D' + ABC' + A'B'CD + ABC.$$

(ii) Implement AND and OR gate using NAND gate.

(c) Implement full adder using half adders and external gates.

3. (a) Obtain the minimal sum of products for the function (use K map) :

$$F(A, B, C, D) = \sum (1, 3, 7, 11, 15)$$

$$d(A, B, C, D) = \sum (0, 2, 5) \quad d : \text{don't care.}$$

(b) Explain the following in brief :

(i) Standard Sum of Product (ii) Standard Product of Sum

(iii) Canonical Sum of Product (iv) Canonical Product of Sum.

(c) Draw the truth table for a three input function given below : $f(A, B, C) = AB + BC + AC$.

4. (a) Implement the full adder with the help of decoders and external gate.

(b) Compare the different type of TTL on the basis of following parameter :

(i) Fan-in (ii) Fan-out (iii) Power dissipation.

(c) Explain 8 x 1 multiplexer.

5. (a) What are the problems in the level triggering ? How it these problems can be removed?

(b) Explain the difference between buffer register and shift register using suitable example.

(c) Design a module-10 ripple counter.