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BCA-01

Computer Fundamental and Introduction to Digital Logic

Bachelor of Computer Applications
(BCA-11/16/17)
First Semester, Examination-2019

Time : 3 Hours **Max. Marks : 80**

Note : This Paper is of Eighty (80) marks divided into two (02) Sections A and B. Attempt the questions contained in these sections according to the detailed instructions given therein.

Section- A
(Long-Answer-type questions)

Note : Section 'A' Contains Five (05) Long-Answer type questions of Fifteen (15) marks each. Learners are required to answer any three (03) questions only.

(3 x 15 =45)

1. What do you mean by combinational circuits? Implement full adder using two half adders. Write down the truth table of a full adder.

2. Develop a truth table for the standard SOP expression A'B'C + AB'C' + ABC.

3. Answer the following :

   (i) What are Minterms and Maxterms?

   (ii) What is Synchronous and Asynchronous counter?

   (iii) Give Comparison between combinational and Sequential logic circuits.

4. Simplify the Boolean function :

   (i) F =

   A'B'C' + B'CD' + A'BCD' + AB'C'

   (ii) F = A'B'D' + A'CD + A'BC

(iii) d = A'BC'D +ACD + AB'D' where "d" indicates Don't care conditions.

5. Explain tabulation method and Simplify the following Boolean function by using Tabulation method.

$F = \Sigma (0,1,2,8,10,11,14,15)$

Section - B
(Short-Answer-Type questions)

Note : Section 'B' contains eight (08) Short-answer type questions of Seven (07) marks each. Learners are required to answer any Five (05) questions only.

(5x7=35)

1. Explain with figures how NAND gate and NOR gate can be used as Universal gate?

2. Explain SOP and POS expression using suitable examples.

3. Draw symbol and construct the truth table for three input Ex-OR gate.

4. Simplify the following Boolean function by means of the tabulation method :$F(A,B,C,D,E,F,G) = \Sigma(20,28,38,39,52,60,102,103,127)$

5. What are Karnaugh maps? Explain the use of Karnaugh maps with suitable example.

6. Explain the different types of multiplexers and demultiplexers and describe advantages and disadvantages of multiplexer and demultiplexer.

7. What are flip flops? Explain the different types of flip flops with neat diagrams.

(5)

8. Calculate the following :

(i) Convert $(126)_{10}$ to Octal

(ii) Convert $(214.32)_{10}$ to binary

(iii) Perform binary substraction using 2's complement for $(62)_{10}$

(iv) Find the one's comlement and two's complement of $(57)_{10}$

(v) Subtract 011011 from 110111