(Please write your Exam Roll No.) 01414202012

Exam Roll No. .....

END TERM EXAMINATION

SECOND SEMESTER [BCA] MAY-JUNE-2013

Paper Code: BCA106 **Subject: Digital Electronics (New)**

Time : 3 Hours **Maximum Marks :75**

Note: Attempt any five questions including Q.no.1 which is compulsory. Select one question from each unit.

Q1. (a) Design a Full Adder circuit using only NANAD gates only. (5)

(b) State and explain the DeMorgen's theorem which converts a sum into a product from and vice versa. (5)

(c) What is Multiplexer? Explain the difference between MUX and DEMUX. (5)

(d) Explain Binary Multiplier. (5)

(e) Simplify the following function in Sum of product from using four variable Karnaugh's map. Draw the resulting logic diagram. (5)

$F(A,B,C,D) = \Sigma (0,1,2,4,5,7,11,15)$

Unit- I

Q.2. (a) (i) Simplify the Expression $AB + \overline{AC} + A\overline{B}C$ (AB+c) (3)

(ii) Simplify the given Boolean Expression (3)

$Y = \overline{A}\,\overline{B}\,\overline{C} + \overline{A}\,B\,\overline{C} + A\,\overline{B}\,\overline{C} + A\,B\,\overline{C}$

(b) Explain what is meant by logic family. Describe three major difference between RTL and DTL. (6.5)

Q.3. (a) Explain how the basic gates can be realized using NAND gates. Draw the useful Diagram. (6.5)

(b) Implement $Y = \overline{AB} + A + \overline{B + C}$ using NAND gates only. (6)

Unit – II

Q.4 (a) Draw a Multiplexer using only NAND gates which selects from four inputs A0 to A3 using two select inputs S0 and S1. (6.5)

(b) Implement the following function using a Multiplexer

P.T.O.

F(A,B,C) = Σ(1,22,5,6) (6)

Q5. (a) How does an encoder differ from decoder? Design 3 X 8 decoder. (6.5)

(b) Design a 4 bit parallel binary adder. (6)

Unit- III

Q.6. (a) Explain in detail the construction and working universal / Bidirectional shift register. (6)

(b) Explain the operation of Master – slave Flip Flop and show how the race around condition is eliminated in it? (6.5)

Q7. (a) Explain the function of a D flip flop using a suitable diagram and discuss how it works as a latch? (6)

(b) How an SR flip flop can be converted into JK flip flop? Give the truth table of JK flip flop Flop. (6.5)

Unit-IV

Q8. (a) Design a MOD 7 binary counter. Draw its state diagram and circuit. (6)

(b) What is a modulus counter? Draw the logic diagram of a 4 bit binary ripple counter using flip-flops that trigger on the positive edge transition. (6.5)

Q.9. (a) What is ROM? Explain the terms volatile memory and non-volatile memory. (6)

(b) What is a ripple counter? Explain the difference the performance of asynchronous and synchronous counter. (6.5)

******