

KRISHNA KANTA HANDIQUI STATE OPEN UNIVERSITY  
MCA/MScIT/PGDCA 1<sup>st</sup> Semester Examination, 2015  
MCA(S1)02/MScIT(S1)02/PGDCA(S1)02

**Digital Logic**

Time: 3 hours

Maximum marks: 80

The figures in the margin indicate full marks for the questions

- 1 *Answer any five questions from the following:* 2×5=10
- a Convert the octal number 675 into its binary equivalent.
  - b Write the full form of EBCDIC. How many bits are used here?
  - c Explain principle of duality.
  - d What are Universal gates and why they called so?
  - e Draw the truth table of Half Adder.
  - f What are flip-flops?
  - g Write two applications of ROM.
- 2 *Write any three questions from the following:* 4×3=12
- a With suitable examples describe BCD code.
  - b Distinguish between minterm and maxterm.
  - c Realize NOT, AND, OR and NOR logic gates using NAND gate only.
  - d Draw the logic diagram of Octal-to-Binary Encoder.
  - e Briefly describe dynamic RAM.
- 3 *Answer any three questions from the following:* 6×3=18
- a Perform the following operations:
    - (i) Add the binary numbers 111.011 and 1110.101 2
    - (ii) Show the binary subtraction of 01111 from 10001000 2
    - (iii) Multiply binary numbers 1100 and 1010 2

- b (i) Obtain the canonical product of the sum expression of  
 $Y(ABC) = (\bar{A}+B)(\bar{B}+C)(\bar{A}+C)$  2
- (ii) Obtain the canonical sum of the product expression of  
 $Y(ABC) = A + \bar{B}C$  2
- (iii) Plot the Boolean expression  
 $Y = AB + \bar{A}\bar{B}C + ABC$   
on the 3 variable Karnaugh map. 2
- c What is a decoder? Draw a 2-to-4 line decoder and truth table for the same. 2+4
- d Write three applications of shift Registers. 6
- e Describe different types of ROM. 6
- 4 *Answer any four questions from the following:* 10×4=40
- a (i) With suitable examples describe fixed point representation and floating point representation of binary numbers. 6
- (ii) Convert hexadecimal numbers  $641A_{16}$  to octal equivalent. 4
- b (i) Simplify the Boolean function  $Y(ABC) = \Sigma(1,3,5,6,7)$  using Karnaugh map method. 5
- (ii) Simplify  
 $Y(ABCD) = \Sigma(0,1,4,5,10,11,14,15)$  using tabulation method. 5
- c Briefly describe OR, AND, NOT, NOR and NAND logic gates with suitable symbol, expression and truth tables. 10
- d (i) Using two half adder, draw circuit diagram of a full adder with 3 inputs. 5
- (ii) Write a short note on 4-bit parallel binary adder. 5
- e (i) Explain different types of Primary memory. 4
- (ii) What is a master-slave flip-flop? With a diagram write clocked mater-slave JK flip-flop using NAND gates. 2+4
- f Write short notes on the following:
- (i) Don't care condition 5
- (ii) Gray Code. 5