## UNIT – IV

**8.** (a) What is full-subtractor ? Design a full-adder and implement the same using gates. 8

(b) What is a BCD to seven-segment Decoder ? Design and implement it. 8

**9.** Explain the following :

(a) Code Converters 8

(b) Comparators 8

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*Roll No. .....*

# 97664

# BCA 1st Semester (New) Examination – November, 2017

## LOGICAL ORGANIZATION OF COMPUTER - I

**Paper : BCA-104**

*Time : Three Hours ]* *[ Maximum Marks : 80*

*Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.*

***Note :*** Question No. 1 is ***compulsory***. Attempt ***four*** questions by selecting ***one*** question from each Unit. All questions carry equal marks.

**1.** (a) What is a multiplexer ? Outline its relevance. $2 \times 8 = 16$

(b) What is Unicode ? State its relevance.

(c) What are Demultiplexers ? State their importance.

(d) What are digital signals ? Explain.

(e) What is the smallest and largest integer number represented in a 32-bit computer ?

(f) What are Venn Diagrams ?

(g) Prove $x.y'+y.z'+z.x' = x'.y + y'.z + z'.x$, algebraically.

(h) What are encoders ?

## UNIT – I

**2.** (a) Which number system is followed in digital computers and why ? 4

(b) Find out the values of X, Y and Z in the following :

$(108.750)_{10} = (X)_2 = (Y)_8 = (Z)_{16}$ 12

**3.** Explain the following :

(a) Error detection and correction codes 8

(b) Character Codes 8

## UNIT – II

**4.** (a) What are De-Morgan's Law ? Illustrate. 6

(b) Kush wants to purchase a bicycle. The bicycle must have brakes. He will buy a bicycle that has either a hand-brake or a foot-brake. No bicycle has both types. Write the Boolean equation for buying a bicycle. Implement the same using basic gates. 10



**5.** Explain the following :

(a) Duality principle 6

(b) Canonical forms of Boolean Functions 5

(c) Boolean Axioms 5

## UNIT – III

**6.** (a) What are Universal Gates ? Why these are named so ? Justify. 6

(b) What do you mean by multilevel NAND and NOR circuits ? Illustrate. 5

(c) What are AND-OR-INVERT and OR-AND-INVERT implementation ? Explain. 5

**7.** (a) What is combinational circuit ? What are its characteristics ? Detail out the procedure for design of combinational circuit. 8

(b) Design a combinational circuit that receives 2-bit binary input and produces its square at the output. 8

*Roll No.* .....

# 97664

## BCA 1st Semester (New) Examination – November, 2018

### LOGICAL ORGANIZATION OF COMPUTERS-I

**Paper : BCA-104**

***Time : Three Hours ]*** ***[ Maximum Marks : 80***

*Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.*

***Note :*** Attempt ***four*** questions by selecting ***one*** question from each Unit. Question No. **1** is ***compulsory***. All questions carry equal marks.

**1.** (a) What is BCD adder ? $2 \times 8 = 16$

(b) What is meant by digital logic ? Explain.

(c) What is the difference between Boolean Algebra and Real Algebra ?

(d) Which number system is followed in digital computers and why ?

(e) What are Demultiplexers ? State their importance.

(f) What is Unicode ? State its relevance.

(g) What is the smallest and largest integer number represented in a 32-bit computer ?

(h) What are code converters ?

## UNIT – I

**2.** (a) What are parity bits ? How are these relevant in error-detection and correction codes ? Illustrate through suitable examples. 7

(b) Find out the values of X, Y and Z in the following : 9

$(75.75)_{10} = (X)_2 = (Y)_8 = (Z)_{16}$

**3.** Explain the following :

(a) Floating-point Representation of numbers 8

(b) Character codes 8

## UNIT – II

**4.** (a) What is principle of Duality ? Illustrate. 6

(b) Simplify the following Boolean expression using K-map : 10

$F(a,b,c) = \Sigma(1,4,5,6,7)$

and realize the same using NAND gates.

**5.** Explain the following :

(a) SOPs and POSs 5

(b) Venn diagrams 5

(c) Boolean Algebra 6

## UNIT – III

**6.** (a) What are Universal Gates ? Why these are named so ? Justify. 6

(b) Design a combinational circuit that receives 4-bit binary input and produces its 2's complement. 10



**7.** (a) What do you mean by multilevel NAND and NOR circuits ? Illustrate. 4

(b) What are AND-OR-INVERT and OR-AND-INVERT implementation ? Explain. 4

(c) What is combinational circuit ? What are its characteristics ? Detail out the procedure for design of combinational circuit. 8

## UNIT – IV

**8.** (a) What is a multiplexer ? How does it work ? What are its applications ? Explain. 8

(b) What is a full-adder ? Design a full-adder and implement the same using gates. 8

**9.** Explain the following :

(a) BCD to seven-segment Decoder 8

(b) Magnitude Comparators 8