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
