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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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