

UNI

8. (a) What is full-subtractor? Design a full-adder and implement the same using 3 gates. 8
- (b) What is a BCD seven-segment Decoder? Design and implement it. 8
9. Explain the following :
- (a) Code Converters 8
- (b) Comparators 8

<https://www.ndupapers.com>

97664-7050-(P-4)(Q-9)(17) (

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?

97664-7050-(P-4)(Q-9)(17)

P. T. O.

- (f) What are Venn Diagrams ?
- (g) Prove  $x.y' + y.z' + z.x$  algebraically.
- (h) What are encode

-I

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

(b) Find out the value of X, Y and Z in the following :  
 $(108.750)_{10} = (X)_2 = (Z)_{16}$  12

3. Explain the following

- (a) Error detection and correction codes 8
- (b) Character Codes 8

II

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

(b) Kush wants to buy a bicycle. The bicycle must have brake either a hand-brake or a foot-brake. No bicycle has both types. Write the Boolean equation for buying a bicycle and 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