Roll No. .....

97664

BCA 1st Semester
Examination – December, 2022

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 : Attempt *five* questions in all, selecting *one* question from each Unit. Question No. 1 is *compulsory*. All questions carry equal marks.

1. (a) What is Unicode ?

(b) What is Number system ?

(c) What is Multiplexer ?

(d) Differentiate Encoder and Decoder.

(e) How does a NAND gate works ?

(f) What is Digital signal ?

(g) What is Boolean Function ?

(h) What is Venn diagram ?

UNIT – I

2. (a) Construct an even parity seven bit hamming code to transmit the data (i) 0100 (ii) 1110.

(b) What is BCD code ? What are the rule for BCD addition ? Explain with suitable example.

3. (a) Perform the following conversions $(37.125)_{10}$ = ( )$_2$ =( )$_8$ =( )$_{16}$.

(b) Add 10110111 and 01110101

(c) Subtract 10001 from 11001.

UNIT – II

4. Simplify the following Boolean function $F(A, B, C, D) = \Sigma(0, 1, 2, 5, 8, 9, 10)$ in SOP. Draw the logic circuit using gates.

5. (a) State and prove De Morgan law.

   (b) Simplify the following Boolean expression :

   (i) ABC'D' + ABC'D + ABCD' + ABCD

   (ii) AB (A'BC' + AB'C' + A'BC)

UNIT – III

6. (a) How to realize OR, NOT, AND using universal gates ?

   (b) What is the design procedure for combinational logic circuit ?

7. (a) What is an exclusive OR and exclusive NOR gate ? Draw its symbol and prepare truth table.

   (b) Explain AND-OR-INVERT and OR-AND-INVERT gate.

UNIT – IV

8. (a) What is full adder ? How a full adder is built using half adder ?

   (b) What is BCD to seven segment Decoder ? Explain.

9. (a) What are Encoders ? Draw and explain a Octal to binary encoder.

   (b) What is full subtractors ? Prepare truth table circuit for full subtractor.