

NBCA/D-23**LOGICAL ORGANISATION OF COMPUTER**

Paper : B23-CAP-103

(CC-C1)

Time : Three Hours]

[Maximum Marks : 50

Note : Attempt *five* questions in all, selecting *one* question from each unit. All questions carry equal marks.

Compulsory Question

1. (a) Prove that 2421 is self complementing code.
(b) State and prove Demorgans' Law.
(c) Make excitation table of T and JKFF.
(d) Differentiate Combinational and Sequential circuits.

UNIT-I

2. Convert as follows :

- (a) (i) $(17.625)_{10}$ to Binary, Octal and Hexadecimal.
(ii) What is number in Binary and Octal for 2C2BF7.
(iii) What is $(X)_2 = (235)_6$.
(iv) (101010111110) to Octal and Hexadecimal.

3. (a) Write coding scheme for 8421 and for Error Detection and Correction system.

- (b) Perform 2's complement arithmetic
 $-22-10$ and $-32-17$.

UNIT-II

4. (a) Define Boolean algebra and write its postulates.
 Solve Using Boolean Algebra.
 $(xx + yy)(xxzz + zz)(\bar{y}\bar{y} + \bar{x}\bar{x}z\bar{z}) = \bar{x}xyyzz.$
5. (a) Draw and Label 4 Variable K-Map and solve for four corners.
- (b) (i) Solve using K-Map $Z = \Sigma 1, 3, 5, 7, 9, 13, 15.$
 (ii) Solve using K-Map $Z = \pi \pi, 00, 22, 44, 66.$

UNIT-III

6. (a) Make circuit using NAND gates only by solving Full Adder.
- (b) Make circuit and explain 4 : 1 Multiplexer and 10 to 4 line encoder.
7. (a) Make TT and diagram for 3 input AND and NOR gate.
- (b) Prove that NAND is universal gate.
- (c) Make Full Adder using NAND gates only.

UNIT-IV

3. Explain Clocked SRFF, its problem and solution.
 9. (a) Explain Master Slave JKFF to solve Race round problem.
(b) Make Shift register to store 1011.
-

Shiksha Sanchar