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GSE/M-21 **1498**

COMPUTER SCIENCE

(Logical Organization of Computer)

Paper–II

Time : Three Hours] [Maximum Marks : 40

Note : Attempt *five* questions in all, selecting *one* question from eaeh unit. Q. No. 1 is compulsory.

Compulsory Question

1. (a) Prove that 2421 is self complimenting.

(b) State and prove Demorgans' Law.

(c) Make TT of three variable NOR and AND gate.

(d) Define Duality principle. 8

UNIT–I

2. Convert as follows :

(a) (i) $(7.625)_{10}$ to Binary, Octal and Hexadecimal.

(ii) What is number in Binary and Octal for C2BF7 ?

(iii) What is $(X)_2 = (2345)_6$?

(iv) (101010111110) to Octal and Hexadecimal.

(b) Write coding scheme for 8421 and for Error Detection and Correction system. 8

3. (a) Write Note on Floating point Notation.

(b) Perform 2's compliment arithmetic.

–22 –12 and –36–17 8

UNIT–II

4. (a) Define Boolean algebra and write its postulates.

(b) Solve Using Boolean Algebra

(i) $(x + y)(xz + z)\ (\overline{\overline{y} + xz}) = \overline{x}yz$.

(ii) $ab + bc + ca$. 8

5. (a) Draw and Label 4 Variable K-Map and solve for four corners.

OR

Make Venn Diagram for OR, NAND and XOR gates.

(b) (i) Solve using K-Map Z = Σ1,3,5,7,9,13,15

(ii) Solve using K-Map Z = π 0,2,4,6. 8

UNIT–III

6. (a) Draw T.T and Gates for OR and NAND, NOR and XOR Gates. 8

(b) Make circuit using logic gates for Full Adder.

7. (a) Make circuit and explain 4 : 1 Multiplexer and 10 to 4 line encoder. 8

(b) Make 10 to 4 line Encoder.

UNIT–IV

8. Explain Clocked SRFF, its problem and solution. 8

9. (a) Make Mod-5 Counter suing JKFF.

(b) Make Shift register to store 1011. 8