

S.E(C) Sem III (o)

library

Con. 2716-09.

Digital Electronics (OLD COURSE)

VR-3054

20/5/09

(3 Hours) Page ① [Total Marks : 100

MASRAN

N.B.: (1) Question No. 1 is compulsory.

(2) Solve any **four** out of remaining **six** questions.

(3) Assumptions made should be **clearly** stated.

(4) **Figures** to the **right** indicate marks.

1. (a) Add the Octal numbers $(341)_8$, $(125)_8$, $(472)_8$ and $(577)_8$. 4
 (b) Convert 0.8125 decimal numbers to its binary equivalent. 4
 (c) Multiply $(1110)_2$ and $(1010)_2$ using binary multiplication method. 4
 (d) Prove De-Morgan's Theorems. 4
 (e) Implement OR Gate using NAND Gates only. 4

2. (a) Prove that— 10
 (i) $\overline{A}BC\overline{D} + B\overline{C}\overline{D} + B\overline{C}D + B\overline{C}D = B(\overline{D} + \overline{C})$
 (ii) $\overline{A}\overline{B} + \overline{A} + AB = 0$
 (b) Design BCD to Excess-3 code converter. 10

3. (a) Implement the following function using K-Map (Use NAND Gates only) 10
 $f(w, x, y, z) = \sum m (1, 4, 5, 6, 11, 12, 13, 14, 15)$
 (b) Using Quine McClusky method minimize the Boolean Expression 10
 $f(A, B, C, D) = \sum m (1, 5, 6, 12, 13, 14) + d(2, 4)$

4. (a) Explain what is master slave Flip Flop and give its applications. 10
 (b) Draw and explain universal Shift Register with its operation. 10

5. (a) Design of a synchronous Mod-6 counter using clocked JK Flip Flops. 10
 (b) Give difference between Synchronous counter and Asynchronous counter. 10
 Give Merits and Demerits of these counters.

6. (a) Implement the following function using 4:1 multiplexer. 10
 $f(A, B, C) = \sum m (1, 3, 5, 6)$
 (b) Write short notes on : 10
 (i) Fan out, Fan in.
 (ii) Propagation Delay.

7. (a) Draw TTL NAND Gate and explain its working. 10
 (b) Short notes on : 10
 (i) Arithmetic and Logic Unit
 (ii) Carry Look ahead Adder.