

SE-ET.
Sem III (old)
DLD.

02/12/2014.

(OLD COURSE)

QP Code :12289

(3 Hours)

[Total Marks : 100

- N.B. :** (1) Question No. 1 is compulsory.
(2) Attempt any **four** from remaining **six** questions.
(3) Figures to the **right** indicate **full** marks.

1. (a) Convert $(154.25)_{10}$ into binary, octal and hexadecimal number systems. 5
(b) Design one bit digital comparator. 5
(c) Design a full adder using 8 : 1 MUX. 5
(d) Simplify the following using Boolean laws. 5
$$f = \overline{A}\overline{B}\overline{C} + A\overline{B}\overline{C} + BC + \overline{A}\overline{B}C + A\overline{B}C$$
2. (a) Simplify using k-map and realize using NAND gates only. 10
$$f(A, B, C, D) = \sum m(1, 3, 7, 11, 15) + d(0, 2, 5)$$

(b) Using Boolean laws prove that NAND and NOR gates as universal gates. 10
3. (a) Design a BCD to 7 segment code converter. 10
(b) Draw a 3 bit binary up-down counter using JK-FF. 10
4. (a) What is a race around condition ? How it is overcome in Master Slave J-K Flip-Flop. 10
(b) Design a 3 bit Binary to Gray code converter and implement. 10
5. (a) Draw a 4 bit universal shift register and explain its operation as shift left and right. 10
(b) Draw a 2 input TTL NAND gate and explain its operation. 10
6. (a) Simplify using Quine McClusky Method. 10
$$f(A, B, C, D) = \sum m(0, 1, 2, 3, 4, 6, 8, 9, 10, 11)$$

(b) Implement the following expression using basic logic gates. 10
$$f(A, B, C, D) = \sum m(0, 1, 3, 5, 7, 9, 10, 15)$$
7. Write short notes on any two :— 20
 - (a) Priority Encoder
 - (b) TTL Vs CMOS logic family
 - (c) PAL and PLA
 - (d) FPGA and CPLD.