

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

(2) Attempt any four questions out of remaining six questions.

1. (a) Convert the decimal number 172.876 to octal number. 2
 (b) Find value of x. 4
 (i) $786.983_{10} = (x)_{16}$
 (ii) $(77.43)_{10} = (x)_6$
 (c) Convert the following binary number to octal number. 2
 (i) 1101.00101
 (ii) 1011011.011 011
 (d) Subtract the given binary number 4
 (i) $110 - 001$
 (ii) $101.01 - 1.01$
 (e) Perform the following operation 4
 (i) $101010 \div 100$
 (ii) 110.1×10.1
 (f) Perform subtraction using 10's complement method 4
 (i) $7.6532 - 4250$
 (ii) $4250 - 76532$

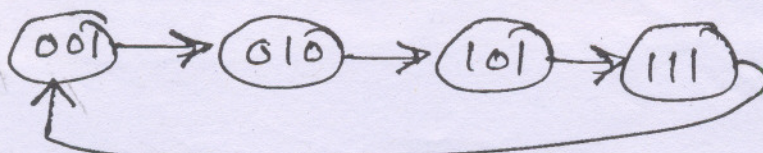
2. (a) Simplify the following using K-map. 6
 (i) $F(A, B, C, D) = \sum m (1, 3, 7, 11, 15) + d (0, 2, 5)$
 (ii) $F(F, B, C) = \sum M (0, 1, 2, 3, 4, 7)$
 (b) (i) Realise full adder using Half adders 6
 (ii) Realise full subtractor using Half subtractors. 4

3. (a) Explain (i) TTL (ii) ECL logic families 10
 (b) Design 64:1 mux using 8 : 1 mux. 6
 (c) Implement the following function using 16:1 mux. 4
 $F(A, B, C, D) = \sum m (0, 1, 3, 4, 8, 9, 15)$

4. (a) Define flip-flop. 2
 (b) Define synchronous and Asynchronous sequential logic circuits. 3
 (c) Define characteristic equation of flip-flop. 3
 (d) Convert D flip-flop into SR flip-flop. 6
 (e) Explain excitation table of flip-flop. 6

5. (a) Explain universal shift Register. 8
 (b) Differentiate between counter and twisted Ring counter. 6
 (c) Explain Johnson's counter. 6

6. (a) Design MOD-6 counter using "T" flip-flop. 6
 (b) Differentiate between synchronous and asynchronous counter. 4
 (c) Design counter by using T flip-flop for the following sequence : 10



7. (a) Draw the block diagram of BCD adder using IC 7483 7
 (b) Simplify following using Q-M Method. 7
 $F(A, B, C, D, E) = \sum m (0, 1, 3, 5, 9, 10, 12, 16, 26)$
 (c) Design X-OR and X-NOR gates using all universal gates. 6