11-11-13-DTP2-KG-26

Con. 7857-13.

K.G.C.E. EXAM KARJAT, RAIGAD

GX-12043

(3 Hours) **[Total Marks : 80**

SE/ Sem- III /INST/ Digital Electronics / 25-11-13

N.B. : (1) Question No. **1** is **compulsory.** Attempt any **three** questions out of remaining **five** questions.
(2) **All** questions carry **equal** marks.
(3) Assume suitable **data** if **necessary**.

1. Solve any **four** out of following :- **20**
   (a) Convert $(123.091)_{10}$ to HEX, Octal and Binary.
   (b) State and prove De Morgan's theorems.
   (c) Implement 4:1 MUX using logic gates.
   (d) Design T flipflop using NAND gates only.
   (e) Explain noise margin and fanout of digital ICS.

2. (a) Performe following operation :- **5**
      (i) $(29)_{10} - (33)_{10}$ using 2's complement method.
      (ii) $(123)_{16} \times (ABC)_{16}$
   (b) Prove that $(A+\bar{B}+AB)(A+\bar{B})(\bar{A}B)=0$ **5**
   (c) Design binary to XS3 code converter using logic gates. **10**

3. (a) Simplify following using K-map and implement using only any one type of universal gates. **10**
      $y = f(A, B, C, D) = \pi M (0, 1, 6, 7, 8, 9)$
   (b) Design full adder using two half adders.. **5**
   (c) Compare demultiplexers and decoders. **5**

4. (a) Implement full subtractor using two 4:1 MUX. **10**
   (b) Design synchronous mod 4 updown counter using JK flip-flops. **10**

5. (a) Design asynchronous decade counter using T flip-flop. **10**
   (b) Design Johnson's counter using D flip-flop. **10**

6. Write short notes on any **four** :- **20**
   (a) Carry look ahead adder
   (b) Basic dynamic RAM Cell.
   (c) ASCII Codes
   (d) FPGA
   (e) ALU.
