Roll No. ....

24043

B. Tech. 3rd Sem.
(Information Technology)
Examination – December, 2012

DIGITAL ELECTRONICS

Paper : EE-204-F

Time : Three Hours]   *[Maximum Marks : 100*

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Attempt *five* questions. Question No. **1** is *compulsory* and *one* question from each of four Sections.

1. (a) Draw and give truth table of :

   (i) Ex-OR gate

   (ii) Nor gate

   (b) Draw and explain 4 : 1 multiplexer

(c) Give truth table of :

    (i) S-R Flip Flop

    (ii) J-K Flip Flop

(d) Differentiate between ASLC and SSLC. 5×4

SECTION – A

2. (a) Simplify the logic function using Quin Mc-Clusby method :   15

$$f(A,B,C,D) = \sum_m (1,3,7,11,15) + d(0,2,5).$$

(b) Simplify : $\overline{A}B + B\overline{C} + BC + A\overline{B}\overline{C}$ 5

3. (a) 7-bit Hamming code is received as 1101101. Locate the error position and find the correct code.   5

(b) Write in brief about cyclic code.   5

(c) Use K-map to simplify :   10

    (i) F= $\sum_m (1,2,3,4,9,11,12,13,15)$

    (ii) $F = \pi(3,4,6,7,11,12,13,14,15)$

SECTION – B

4. (a) Draw and explain BCD adder using IC 7483.   10

(b) Give truth table, Boolean equation and circuit for full substractor. 10

5. (a) Design a 16 : 1 multiplexer using 8 : 1 multiplexer. 10

(b) Draw block diagram, truth table and circuit for 1-bit comparator. 10

SECTION – C

6. (a) Design a 3 bit synchronous counter using J-K flip flop. 15

(b) Differentiate between synchronous and asynchronous counter. 5

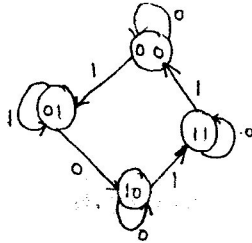7. (a) What is a shift register ? Draw circuit diagram for : 15

(i) Serial in parallel cut

(ii) Parallel in serial cut shift registers using J-K Flip-Flop.

(b) Convert J-K Flip-Flop into S-R Flip-Flop. 5

SECTION – D

8. (a) For state diagram shown in figure, obtain the state table and design the circuit using minimum no. of J-K Flip-Flop.   15

(b) Define primitive flow table and non-primitive flow table.   5

9. Write short notes on the following : 2×10

(i) Hazards,

(ii) PLA and PAL.