Total No. of Questions : 10] [Total No. of Printed Pages : 3

Roll No. .....

EC–403(N)

B. E. (Fourth Semester) EXAMINATION, June, 2010

(New Scheme)

(Electronics & Communication Engg. Branch)

DIGITAL ELECTRONICS

[EC–403(N)]

Time : Three Hours

Maximum Marks : 100

Minimum Pass Marks : 35

Note : Attempt *one* question from each Unit. All questions carry equal marks.

Unit–I

1. (a) Convert the following :

(i) $(329 \cdot 54)_{10} = (\ )_{16}$

(ii) $(BD02 \cdot 1A)_{16} = (\ )_{10}$

(iii) $(1101)_{gray} = (\ )_2$

(iv) $(967 \cdot 345)_{10} = (\ )_8$

(v) $(BA05 \cdot 49\,A)_{16} = (\ )_4$

(b) Minimise the following function using K-map and then realise it using NOR gate :

$$Y = \overline{\overline{AB} \cdot \overline{CD} \cdot AD}$$

P. T. O.

Or

2. (a) Simplify the following expression using Boolea algebra :

(i) $\overline{A\overline{B} + ABC + A(B + A\overline{B})}$

(ii) $(A + B)(\overline{A}\,\overline{C} + C)\overline{(\overline{B} + AC)}$

(b) Find the minimal sum of products for the Boolear expression $f = \Sigma\,(1, 2, 3, 7, 8, 9, 10, 11, 14, 15)$, usin the Quine-McCluskey method.

Unit – II

3. (a) Design a 4 bit parallel Adder/Substractor.

(b) Explain the working of a look ahead carry generator.

Or

4. (a) Implement the following function using a multiplexer :

$$F(A, B, C, D) = \Sigma\,(1, 5, 6, 7, 8)$$

(b) Design a BCD to Binary code converter.

Unit – III

5. (a) With the help of circuit diagram and timing diagram explain the working of Astable Multivibrator.

(b) Explain the working of JK flip-flop. What is the need of triggering in the flip-flops and how it is achieved ?

Or

6. Design a MOD-11 ripple counter using J-K flip-flop.

Unit – IV

7. (a) Design a combinational circuit that gives a binary output equal to the square of binary coded decimal number 0 through 9 using diode matrix ROM.

(b) Explain the working of Bipolar PROM array with fusible links.

Or

8. (a) Explain the architecture and working of field programmable gate array.

(b) Design a binary to excess-3 code converter using PLA.

Unit – V

9. (a) Discuss the major difference between a bipolar integrated circuit and a MOS integrated circuit.

(b) Explain ECL logic. Why is it faster than TTL logic ?

Or

10. (a) Explain the working of CMOS logic. Justify that its switching speed is greater than PMOS/NMOS.

(b) What are BiCMOS logic circuits ? What are their advantages ?