Roll No. ....

EX–403

B. E. (Fourth Semester)
EXAMINATION, June, 2012
(Grading/Non-Grading)

(Electrical & Electronics Engg. Branch)

DIGITAL ELECTRONICS AND LOGIC DESIGN – I

(EX – 403)

Time : Three Hours

Maximum Marks : $\begin{cases} GS : 70 \\ NGS : 100 \end{cases}$

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

Unit – I

1. (a) Convert the following numbers to the numbers of the base shown below :

   (i) $(53 \cdot 625)_{10} = (\quad)_2$

   (ii) $(444 \cdot 456)_{10} = (\quad)_8$

   (iii) $(A3B)_{16} = (\quad)_8$

   (iv) $(1010111)_G = (\quad)_2$

   (b) Using the K-map method, simplify the following Boolean function and obtain :
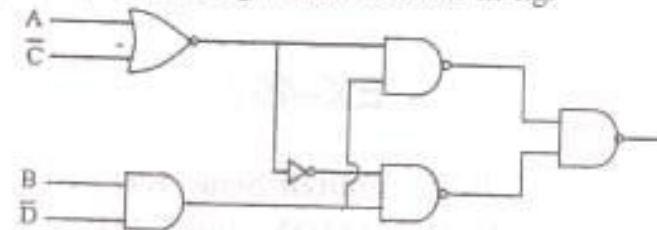
   (i) Minimal SOP

   (ii) Minimal POS expression :

   $Y = \Sigma_m (0, 2, 3, 6, 7) + \Sigma_d (8, 10, 11, 15)$

   P. T. O.

Or

2. (a) Simplify the logic circuit shown in fig.

   (b) Simplify the expression :

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

Unit – II

3. (a) Design a full subtractor using logic gates.

   (b) Implement the Boolean expression :

   $$Y = \Sigma (0, 2, 4, 5, 7, 12)$$

   using multiplexer.

Or

4. (a) Design and explain look ahead carry generator.

   (b) Explain the working of serial adder and subtractor.

Unit – III

5. (a) With the help of block diagram and waveform explain the working of clocked J-K flip-flop.

   (b) What is Race around condition and how it could be eliminated ?

Or

6. (a) What is meant by edge triggering ? Discuss the working of the edge triggering circuit.

   (b) Explain the working of S-R flip-flop. Also draw its state diagram and write its characteristic equation.

Unit—IV

7. (a) Design a MOD-7 counter using T flip-flop.

   (b) Explain the working of shift left-shift right registers.

Or

8. (a) Explain the working of BCD counter.

   (b) Compare the performance of synchronous and asynchronous counter.

Unit—V

9. (a) Explain the working of static RAM cell using MOS transistor.

   (b) Explain the working of successive approximation type analog to digital converter.

Or

10. (a) Write a short note on PAL.

    (b) Explain the working of Binary weighted digital to analog converters.

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