CSc.111-2077 ✡

Tribhuvan University
Institute of Science and Technology
2077

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Bachelor Level / First Year/ First Semester/ Science
Computer Science and Information Technology (CSc. 111)
(Digital Logic)
(NEW COURSE)

Full Marks: 60
Pass Marks: 24
Time: 3 hours.

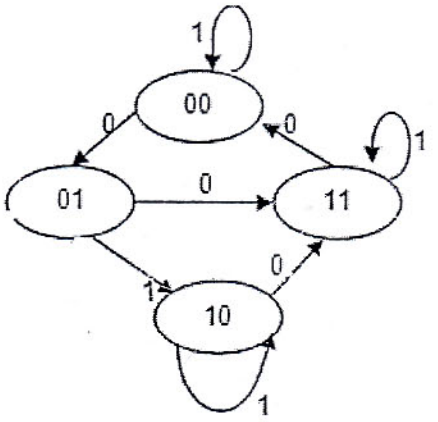
Candidates are required to give their answers in their own words as for as practicable.
The figures in the margin indicate full marks.

Attempt any two questions: (2×10=20)

1. Design a combinatorial circuit that generates 9's complement of a BCD number. (10)

2. Implement the following functions using PLA (10)
   w (A, B, C, D) = ∑(2,12,13)
   x (A, B, C, D)= ∑ (7,8,9,10,11,12,13,14,15)
   y (A, B, C, D) = ∑ (0,2,3,4,5,6,7,8,10,11,15)
   z (A, B, C, D) = ∑ (1,2,8,12,13)

3. Design sequential circuit specified by the following state diagram using T flip-flops. (10)



4. List two major characteristics of digital computer. Represent -6 (negative six) using 8 bits in signed magnitude, signed-1's-complement and signed-2's-complement respectively. Represent decimal number 4673 in a) octal, and b) BCD. (1+2+2)

5. Where is CMOS suitable to use? Define Power dissipation. Show that the positive logic NAND gate is a negative logic NOR gate and vice versa. (1+1+3)

6. Simplify the following function and implement them with two level NOR gate circuit, F(w, x, y, z) = $wx' + y'z' + w'yz'$ (5)