Bachelor Level/ First Year/ Second Semester/ Science   Full Marks: 60
Computer Science and Information Technology (CSc. 151)   Pass Marks: 24
(Digital Logic)   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.

Long Answer Questions:
Attempt any two questions.

                                                         (2x10=20)

1. What is a decoder? Implement the following using decoder.

       a) F (W X Y Z) = $\sum$ (0, 1, 3, 4, 8, 9, 10)

       b) F (W X Y Z) = $\sum$ (1, 3, 5, 6, 11, 13, 14)

2. What do you mean by asynchronous counter? Design a mod-6 synchronous counter using T Flip-flops.
3. Explain the Master-slave S-R Flip-flop with logic diagram, truth table and timing diagram .

Short Answer Questions: (8x5=40)
Attempt any eight questions:

4. Design a Half subtractor using only NOR gates.
5. Convert the following decimal numbers into Hexadecimal and Octal number.
       a) 220
       b) 1020
6. Design a multiplexer 4 x 1 using only universal gates.
7. What is J – K flip flop? Explain.
8. Write a procedure to reduce K- maps.
9. What are the various types of shift registers?
10. Draw a logic diagram of a 4 bit ripple counter using D- flip flop.
11. Differentiate between combinational logic and sequential logic. List some applications of sequential logic.
12. Explain the decimal adder.
13. Write short notes on:
a) Programmable logic array (PLA)
b) Triggering at flip-flop
c) Memory unit

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