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 far as practicable.
The figures in the margin indicate full marks.

Long Answer Questions:
Attempt any two questions.

                                                                                    (2x10=20)

1. What are the various types of numbering systems use in digital logic? Explain. Convert the 3EC8 16 into different numbering system that you know.
2. Design the mod – 6 asynchronous counter and explain with truth table.
3. What is demultiplexer? Draw its block diagram and explain its working principle.

Short Answer Questions:
Attempt any eight questions.

4. Convert the hexadecimal number 2BCF to binary and then to octal.
5. Proof the De-Morgan 1 st and 2 nd theorem with truth table and logic gates.
6. Simplify the following Boolean function using three variables K-map.
(a) $F(X, Y, Z)=\sum(0, 3, 2, 5)$
(b) $F(A, B, C)=\sum(0, 2, 4, 5, 6)$
7. Simplify the Boolean expression.
$$Y = \overline{\overline{\overline{A}}}. B + \overline{\overline{\overline{A}}} + \overline{B}$$
Prepare truth table to show that the simplified expressions is correct or not?
8. Explain the PLA (Programmable Logic Array).
9. How JK flip flop can convert into a D – flip flop? Explain.
10. What do you mean by synchronous counter? Explain with truth table.
11. Draw a 3 to 8 decoder circuit and explain its operation.
12. Mention the difference types of shift registers and explain.
13. Write short notes on:
        (a) CMOS
        (b) Universal gates
        (c) Error detection code

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