TRIBHUVAN UNIVERSITY
FACULTY OF MANAGEMENT
Office of the Dean
March - April 2023

Full Marks: 60
Pass Marks: 30
Time: 3 Hrs.

BIM / Second Semester / IT 233: Digital Logic

Candidates are required to answer the questions in their own words as far as practicable.

Group "A"

Brief Answer Questions:

[10 × 1 = 10]

1. What is digital system?
2. How many different combination can be represented by 5-bit binary data?
3. What is the use of Karnaugh Map?
4. How many input lines are required to generate 995 decoded lines?
5. Differentiate between combinational and sequential circuit.
6. What is the problem of "T" flip-flop?
7. What is the number of clock pulses required to input and output "5" bit data in parallel in serial out shift register?
8. Define don't case condition.
9. How many don't case condition are possible in 8 × 3 encoder?
10. Why flip flop is said to be 1 bit memory?

Group "B"

Short Answer Questions: (Attempt any FIVE Questions)

[5 × 3 = 15]

11. Convert $2A3B.2A_{16}$ into binary, octal and decimal.
12. Realize the property of AND, OR and NOT gate using NAND gate.
13. If a Boolean function $F = \bar{x}y + x\bar{y} + xyz$, solve the given function using K-map.
14. Design 4 × 1 multiplexer.
15. Explain triggering of a flip-flop with its types.
16. If a Boolean function $F = AB + \bar{B}C$, find a equivalent POS.

Group "C"

Long Answer Questions: (Attempt any THREE Questions)

[3 × 5 = 15]

17. What is gray code? Design 3-bit synchronous counter.
18. You are provided with data bits 1011. The register provided has the capability to store all bits in one clock pulse and can be retrieved those stored bits only one at a time from right most flip flop. Your work is to draw the circuit and show all necessary steps to store and retrieve the provided data in provided register.
19. Design a circuit diagram of a 3-bit parallel adder.

20. What is the advantage of JK flip flop over clocked SR flip flop? Explain the operational characteristics of JK flip flop with logic diagram.

Group "D"

Comprehensive Answer / Case / Situation Analysis Questions: *[2 × 10 = 20]*

21. What is Boolean algebra? List any five Boolean rules and verify any two Boolean rules using truth table method.

22. Differentiate between PLA and ROM. Design MOD-150 asynchronous counter.

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