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

Brief Answer
Questions:

1. What is digital system?

Group "A"

[10 × 1=10]

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?

Differentiate between combinational and sequential circuit.
5.

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 x 3 encoder?

10. Why flip flop is said to be 1 bit memory?

flop is sai

Group "B"

Short Answer *Questions*: *(*Attempt any *FIVE Questions)*

11. Convert **2A3B.2A16 into binary,** octal **and decimal**.

12. Realize the property **of AND**, **OR and NOT** gate using NAND **gate**.

[5×3=15]

13. If a **Boolean function $F = xy + xy + xyz$, solve the** given **function using K**-map.

14. **Design 4** x 1 **multiplexer.**

15. Explain triggering of a flip-flop with its types.

If a **Boolean function $F = AB + BC$,** find **a equivalent** POS.

Group "C"

Long Answer *Questions***:** (*Attempt* any ***THREE*** *Questions)*

1. **What** is **gray code? Design 3-**bit synchronous counter.

[3x5=15]

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.

FACULTY **OF** MANAGEMENT

Office **of the** Dean

October **2023**

BIM / Second Semester/IT **233: Digital Logic**

Pass Marks: 30

Time: 3 Hrs.

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

Group "A"

1.

What will be the value of x + **xy** according to Boolean **rule?**

Brief Answer *Questions***:**

[10 × 1 = 10]

2.

Define Digital System.

Prove any statement of Demorgan theorem for **two** variable using truth table.

3.

4.

What is asynchronous counter?

5.

6.

Differentiate between positive edge **triggering** and **negative edge** triggering. **How** the number **of cell** is **determine** in **a** K-map?

7. Define ROM.

8.

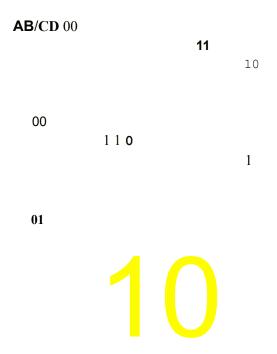Convert gray code: **1011 to** binary.

9.

Define POS.

10. **Define** shift register.

Group "B"

*Short **Answer** Questions: (Attempt any FIVE **Questions**)*

11. Convert **(2A31) 16** into **decimal,** binary **and** octal form.

12. Realize **the** property **of** NOT, **NOR and AND** gate **using NAND** gate.

13. Compute **(-20)**10+ **(+30)10, using** 2's complement method.

14. List out **the** design procedure **of combinational** circuit.

15. **Design 1** x 4 D- **multiplexer**.

16. **Write the** expression **in SOP** for **the following** Karnaugh **Map:** .

AB/CD 00

11

10

00

1 1 **0**

1

01

10

0

X

11

10

X

*

11

0 0

X

[5×3 = 15]

Group "C"

Long Answer *Questions: (*Attempt *any THREE* Questions)*

17. Design MOD-120 Asynchronous counter.

18. Design a circuit diagram for **3**-bit binary **adder**.

19. What is bidirectional register? Explain **with** example.

[3x5=15]

20. Minimize the boolean function: $f(M, N, P, R) = (0, 3, 5, 7, 9, 10, 12, 15,)$ with don't care condition $d(M, N, P, R) = \Sigma (2,4,6,8)$ using **K**-map and design a circuit diagram with a simplified expression.

Group "D"

*Comprehensive **Answer** | Case/Situation Analysis Questions: [2x10=20]*

21. Analyze the property of flip-**flop** which **will have indeterminate state** when set and reset inputs are **"1"** and illustrate the operational characteristics of flip-flop that solve the mention problem.

22. Design **8 × 3** Encoder. Analyze the number of don't care condition in the design of 8 x 3 encoder.