

8. State the differences between sequential and combinational circuit. Draw the RS flip-flop using NAND gate and explain its working.
9. What do you understand by Number System ? Explain the types of number system in detail. Also, explain r's complement and (r-1)'s complement ion in detail.

Section–C **2×16=32**

(Long Answer Type Questions)

Note :- Answer any *two* questions. You have to delimit your each answer maximum up to **500** words. Each question carries 16 marks.

10. What is the Adder ? Draw and explain the operation of a 4-bit parallel adder.
11. What is the advantage of JK flip-flop over on RS flip-flop ? Explain the working of JK flip-flop.
12. What is a Decoder ? Draw and explain the working of 3-to-8 decoder.
13. Explain the operation of 2-input XOR gate and realize it using NAND and NOR gates.

MCA-02

December – Examination 2022

MCA Examination

DIGITAL LOGIC

Paper : MCA-02

Time : 3 Hours]

[Maximum Marks : 80

Note :- The question paper is divided into three Sections A, B and C. Write answers as per the given instructions.

Section–A

8×2=16

(Very Short Answer Type Questions)

Note :- Answer all questions. As per the nature of the question delimit your answer in one word, one sentence or maximum up to **30** words. Each question carries 2 marks.

1. (i) What is meant by 'base' or 'radix' of a number system ?
- (ii) State the De-Morgan theorem.
- (iii) What are the universal gates ?
- (iv) Define Decoder.
- (v) What is flip-flop ?
- (vi) Define access time of memory.
- (vii) What do you understand by sum-of-product form ?
- (viii) What is Flash Memory ?

Section-B **4×8=32**

(Short Answer Type Questions)

Note :- Answer any *four* questions. Each answer should not exceed **200** words. Each question carries 8 marks.

2. What is Random Access Memory (RAM) ? Explain the 3D structure of with their internal organizational structure.
3. What do you understand by Multiplexer ? Draw 8-to-1 multiplexer and explain its working in detail.

4. Write the differences between asynchronous and synchronous counter. Draw a mod-8 counter and explain its working in detail.
5. Define Read Only Memory (ROM). Explain the types of ROM in detail. Also explain the organization of ROM cell.
6. Draw the following logic gates and explain the truth table in detail.
 - (a) AND Gate
 - (b) OR Gate
 - (c) NOT Gate
 - (d) Ex-OR Gate
 - (e) NAND Gate
 - (f) NOR Gate
7. What are the basic operations of Boolean algebra ? Define Maxterm and Minterm. Explain, how are the terms 'maxterms' and 'minterms' related to each other.