

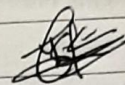
Roll No:- 131FE17

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Exam Seat No:- A4363

Subject - Digital Electronics

Signature:-



Main que. NO:- 3

Sub que. NO:- A

Sub que. NO:- i)

Classification of Memories based on Physical characteristics and Mode of Access:-

Ans i) RAM:-

- RAM is the abbreviated form of Random Access Memory. It is possible to read as well as write data into a RAM, hence it is also called as Read Write Memory (RWM).
- The memory locations can be quickly traced due to the quick memory logic. This is one of the benefits of using RAM over sequential circuits.
- RAMs are fabricated using Bipolar Transistors or MOSFETS.
- Read and write processes can take place almost at the same time.
- RAMs are further classified into two types: Static RAMs or SRAMs and Dynamic RAMs or DRAMs.

ii) ROM:-

- ROM is the short hand of Read Only Memory. The data in ROMs is written by the manufacturer as per the user requirements.
- Data written once cannot be ~~be~~ rewritten again. Hence only reading of memory data is possible in ROMs.
- The process of writing data is much more complex than reading data.
- This drawback is rectified in EPROM and E<sup>2</sup>PROM.
- EPROM:- EPROM is a type of <sup>erasable</sup> programmable ROM in which data can be erased and rewritten to the ROM.
- EEPROM:- EEPROM is electrically erasable programmable ROM in which data can be erased sequentially and rewritten.

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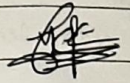
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Main Que. No:- 3

Sub Que. No:- A

Sub Que. No:- ii)

Complex Programmable Logic Devices:-

- i) The standard Programmable Logic Arrays and Programmable Array Logics have limited number of inputs, product terms and outputs.
- ii) The standard PLDs like PLAs and PALs can offer inputs and outputs only upto 32 which is very less.
- iii) Hence, we make use of Complex Programmable Logic devices (CPLDs) to provide more number of product terms, outputs and inputs.
- iv) The Complex Programmable Logic Devices can provide upto 10000 inputs & outputs.

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Main que. No:- 3

Sub que. No:- B

Sub que. No:- i)

\* Drawbacks of R-2R ladder D/A converter:-

- i) The time conversion for the Digital to Analog conversion takes a lot of time and is time consuming.
- ii) This drawback can be overcome with the help of a Modified weighted Resistor D/A converter by applying a known reference ~~voltage~~ ~~Ref~~ resistance  $R_{ref}$

iii) for modified weighted resistor;

$$I_o = I_1 + I_2 + I_3 + \dots + I_n$$

$$\therefore I_o = \frac{V}{R} 2d^{-1} + \frac{V}{R} 2^2 d^{-2} + \dots + \frac{V}{R} 2^n d^{-n}$$

$$= \frac{V}{R} [2d^{-1} + 2^{-2}d^{-2} + \dots + 2^{-n}d^{-n}]$$

$\therefore$  Vo i.e. output voltage is given by;

$$\therefore V_o = I_o \times R_{ref}$$

$$= \frac{V \cdot R_{ref}}{R} [2d^{-1} + 2^{-2}d^{-2} + \dots + 2^{-n}d^{-n}]$$

$$\text{Let } \frac{R_{ref}}{R} = K$$

$$\therefore V_o = KV [2d^{-1} + 2^{-2}d^{-2} + \dots + 2^{-n}d^{-n}]$$

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