Roll No :- 131FE17 Sem - IV

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 :-

a) 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).

b) The memory locations can be quickly traced due to the quick memory logics. This is one of the benefits of using RAM over sequential circuits.

c) RAMs are fabricated using Bipolar Transistors or MOSFETS.

d) Read and write processes can take place almost at the same time.

e) RAMs are further classified into two types: Static Rams or SRAMS and Dynamic RAMS or DRAMS.

ii) ROM :-

a) ROM is the short hand of Read only Memory. The data in ROMS is written by the manufacturer as per the user requirements.

b) Data written once cannot be can rewritten again. Hence only reading of memory data is possible in ROMS.

c) The process of writing data is much more complex than reading data.

d) This drawback is rectified in EPROM and E^2PROM.

e) EPROM :- EPROM is a type of erasable programmable ROM in which data can be erased and rewritten to the ROM.

f) EEPROM :- EEPROM is electrically erasable programmable ROM in which data can be erased sequentially and rewritten.

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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~~ Vref resistance Rref

iii) for modified weighted resistor;

$I_o = I_1 + I_2 + \cdots + I_n$.

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

$= \frac{V}{R}\left[2d^{-1} + 2^{-2}d^{-2} + \cdots + 2^{-n}d^{-n}\right]$.

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

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

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

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

$\therefore V_o = KV\left[2d^{-1} + 2^{-2}d^{-2} + \cdots + 2^{-n}d^{-n}\right]$.