

**BT-5/D06**  
**COMPUTER HARDWARE DESIGN**  
**PAPER - ECE-303E**  
**Option-II**

Time : 3 Hrs.

Maximum Marks : 100

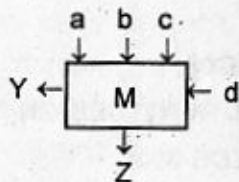
Note : Attempt any five questions.

1. a. Define following :
  - i. Recurring Re-entrant Program
  - ii. Common Storage Pure Procedure
  - iii. Macro
  - iv. Closed Subroutine
- b. What is Micro Operation ? Discuss its significance. 5
- c. How Floating Point Numbers are represented ? Explain. 5
2. a. What is Addressing Mode ? Give examples for following addressing modes and explain :
  - i. Immediate
  - ii. Register Indirect
  - iii. Relative Address Mode
  - iv. Direct Address Mode
- b.  $X = (A * B - C * D / (F + G)) / (OH - I/J)$   
Evaluate X using
  - i. Two Address Machine
  - ii. One Address Machine
  - iii. Zero Address Machine

iv. Three or More Address Machine

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3. a.



This cell M evaluates the arithmetic expression  $ac + b + d$ . Design a combinational array circuit to multiply two 4-bit positive binary numbers using this cell M. 10

b. Write an algorithm for floating point addition and explain its working with help of an example, 10

4. a. Write a note on Microprogram address sequencer for a Control Memory. 10

b. What are advantages of Microprogrammed Control unit over hardwired control unit with reference to the instruction set of a processor? 10

5. a. What are different Semi Conductor Memories? 5

b. Assume that a  $512 \times 8$  RAM has chip select lines  $\overline{CS1}$  and  $\overline{CS2}$  and RD/WR line, and  $1K \times 8$  ROM has also two chip select lines  $\overline{CS1}$  and  $\overline{CS2}$ . Design a memory system having an 8-K bytes of RAM and 16-K bytes of ROM and explain your design. 15

6. a. A certain moving-arm disk-storage device has following characteristics :

Number of tracks per recording surface : 200

Disk Rotation Speed : 2400 rev/ min.

Track Storage Capacity : 62,500 bits

Estimate the Average Latency and the data transfer rate

(5th sem. Electronics)

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of this device. 10

b. Explain working of Magnetic Bubble Memory. 10

7. a. Explain instruction pipeline and arithmetic pipeline. 8

b. List the steps of CPU-responses to an interrupt request. 4

c. What are Mesh Networks? Describe. 4

d. Elaborate Single Line Interrupt System. 4

8. a. Draw a Flow chart to demonstrate the behaviour of a typical IO processor (IOP). 10

b. Compare formats of IO instructions executed the CPU and executed by an IOP. 10

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