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Printed Pages : 2

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BT-5 / D–15

COMPUTER HARDWARE DESIGN

Paper–ECE-303-E

Time allowed : 3 hours] *[Maximum marks : 100*

*Note : Attempt any **five** questions selecting at least **one** from each unit. All questions carry equal marks.*

Unit–I

1. (a) What is the difference between direct addressing mode and indirect addressing mode ? Explain using suitable examples.

   (b) What do you understand by 1's and 2's complement representation of binary numbers ? What is the need of complement representation ? Discuss the advantage of using 2's complement over 1's complement.

2. (a) What do you understand by zero address instruction format? Explain using suitable examples.

   (b) Represent the decimal number 5783 :

   (i) in BCD

   (ii) in excess-3 code

   (iii) in 2,4,2,1, code, and

   (iv) as a binary number.

Unit–II

3. (a) What do you understand by fixed-point and floating-point representation of information ? A digital system is to store binary number is a 16-bit register. Assuming 5 bits are reserved for exponent and 11 bits are reserved for the mantissa and sign, how would (–12.4) and (183.25) decimal numbers be represented in this system.

(b) Design a circuit that compares two 4 bit numbers, A and B, to check if they are equal,

The circuit has one output x, so that x=1 if A=B, and x=0 if A≠B.

4. Write short notes on following :

(a) Microprogrammed computers

(b) Vector processors

Unit–III

5. What do you understand by RAM, ROM, PROM, and EPROM? Design a 2½ D RAM consisting of 32 locations and each location of 8 bits and also explain its working.

6. What do you understand by virtual memory ? What is the difference between paged and segmented virtual memory ? Also discuss the problem of thrashing.

Unit–IV

7. What do you understand by Direct Memory Access ? What is cycle stealing ? Draw the block diagram of DMA controller and discuss its working.

8. What do you understand by Interconnection Structures ? What is multistage network ? What is omega network ? Explain.