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MCS–202

POST GRADUATE DIPLOMA IN COMPUTER APPLICATIONS (PGDCA–NEW)

Term-End Examination

June, 2025

MCS-202 : COMPUTER ORGANIZATION

Time : 3 Hours *Maximum Marks : 100*

Weightage : 70%

Note : *Question No.* ***1*** *is compulsory and carries 40 marks. Attempt any* ***three*** *questions from Q. No.* ***2*** *to Q. No.* ***5****.*

1. (a) Write the binary equivalent for the following decimal numbers : 6

   (i) –23456

   (ii) 299

   (iii) 17.89

(b) Explain the importance of locality of reference with the help of an example. 5

(c) What is the role of a 'flag' register in 8086 microprocessor ? Can it be used as a general purpose register ? 5

(d) List and explain any *four* data transfer instructions of a computer. 4

(e) Add the following decimal numbers by converting them to 8 bit signed 2's complement notation : 4

(i) + 56 and – 56

(ii) + 121 and + 8

(f) What is an I/O interface ? List major functions of I/O interface. 4

(g) With the help of a block diagram, explain the concept of Direct Memory Access (DMA). 4

(h) Write an 8086 assembly program that interchanges the values of two memory locations. 4

(i) How are characters recognised by voice-based input devices ? 4

2. (a) Simplify the function : 5

$$f = \left(\left(A' + B \right) + \left(A.B' \right)' \right)'$$

(b) Define SOP and POS form of Boolean functions with the help of an example of each. 5

(c) What is a flip-flop ? How is it different from a latch ? Also, explain the working

of the following flip-flops along with necessary diagrams : 10

(i) Master-Slave flip-flop

(ii) Edge-Triggered flip-flop

3. (a) Assume that a computer system has the following memories : 6

(i) RAM 64 words with 16-bits word.

(ii) Cache of 8 blocks (block size – 32 bits).

Find in which location of Cache memory a decimal address '21' can be found if direct mapping is used.

(b) List the advantages and disadvantages of Associative Memory. 4

(c) Explain how RAID technology enhances the performance and reliability of data storage. Also, summarize the characteristics of any *three* RAID-levels. 10

4. (a) Explain the role of the following types of registers : 6

(i) General purpose register

(ii) Address register

(iii) Data register

(b) With the help of a block diagram, explain the fixed-point arithmetic logic unit. 8

(c) Explain the process of execution of a micro-program. 6

5. Write short notes on the following : 4×5=20

(a) Indirect Addressing Mode

(b) COM Program

(c) Dynamic Random Access Memory (DRAM)

(d) Von Neumann Architecture

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