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MCS–012

MASTER OF COMPUTER APPLICATIONS (REVISED)/BACHELOR OF COMPUTER APPLICATIONS (REVISED) (M. C. A./B. C. A.)

Term-End Examination

June, 2026

MCS-012 : COMPUTER ORGANISATION AND ASSEMBLY LANGUAGE PROGRAMMING

Time : 3 Hours *Maximum Marks : 100*

Note : *(i) Question No. **1** is compulsory and carries 40 marks.*

*(ii) Attempt any **three** questions from the rest.*

1. (a) Convert the following binary numbers to their decimal equivalent : 4

   (i) 1100.1101

   (ii) 10101010

   (b) Simplify the following using Karnaugh's map : 4

   $F(A, B, C, D) = \Sigma(0, 1, 2, 6, 8, 9, 10)$

   (c) Add the following numbers in 8-bit register using signed 2's complement : 4

   (i) + 45 and – 65

   (ii) + 75 and + 85

   (d) Can a full adder be constructed using 2 half adders ? Explain. 4

   (e) What is flip-flop ? What are its uses ? 4

   (f) What are the functions of I/O interface ? 4

(g) What will be the value of R2 operand if : 4

(i) Mask operation using R2 register clears register R1 containing 01100010.

(ii) Bits 10110001 is to be inserted in an 8 bit R1 register containing 00000000.

(h) Find the physical address for the following segment register : offset pair in the context of 8086 micro-processor : 6

(i) SS : SP $\Rightarrow$ 0100h : 0020h

(ii) CS : IP $\Rightarrow$ 4200h : 0123h

(iii) DS : BX $\Rightarrow$ 0200h : 0100h

(i) Write a programme using 8086 assembly language that inputs a letter from keyboard and responds : 6

"The letter you typed is ..... ."

2. (a) Explain Interrupt-driven Input/Output with the help of a flowchart. 6

(b) With the help of example, explain Register transfer and Arithmetic micro-operations. 6

(c) Convert the following numbers in given format : 8

(i) $(22.6)_8 = (\ )_2$

(ii) $(342)_{10} = (\ )_{16}$

(iii) $(33)_{10} = (\ )_2$

(iv) $(OFF)_{16} = (\ )_{10}$

3. (a) Draw the block diagram of control unit operation. Explain briefly. 6

   (b) Explain different flags in a flag register. 6

   (c) Differentiate between Associative mapping and Set Associative mapping for Cache memory with the help of an example. 8

4. (a) Explain any *three* data transfer instructions of 8086 micr processor with example. 6

   (b) Draw the flow diagram of Instruction cycle of a computer. 6

   (c) Differentiate between the following : 8

      (i) ROM and RAM

      (ii) SIMM and DIMM

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

(i) Unicode

(ii) Cache Memory

(iii) Bit Manipulation Instructions

(iv) Int 21H

(v) ALU

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