No. of Printed Pages : 7

MCS–202

POST GRADUATE DIPLOMA IN COMPUTER APPLICATIONS (PGDCA–NEW)

Term-End Examination

December, 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) Discuss the need of Control unit, Arithmetic logic unit memory and I/O devices in any computer system. 6

(b) Differentiate between Multiprocessor and Multicore processor. 4

(c) Add the following decimal numbers by converting them to 8-bit signed 2's complement notation. Also indicate overflow, if any : 5

(i) + 50 and – 50

(ii) + 120 and + 9

(d) Simplify the following function using K-map :

$F(A, B, C, D) = \Sigma (0, 3, 5, 7, 9, 10, 11, 12, 15)$

and draw the logic circuit of the function so obtained. 5

(e) How many RAM chips of size 256 K × 4 bit are required to build 1 M byte of memory ? 5

(f) Considering that a computer has Program Counter (PC), Instruction Register (IR), Data Register (DR) and a Memory Address Register (MAR), write the microoperations for fetch cycle of an instruction on this computer. 5

(g) What is the role of flag register in 8086 microprocessor ? Can it be used as a general purpose register ? Give the uses of any *four* flags. 5

(h) Explain the use of large register file in RISC architecture with the help of a diagram. 5

2. (a) A number using IEEE 754 (32 bit) is given. What is the equivalent decimal value ? 6

Sign bit (S)	Exponent of length 8 bits	Significant / Mantissa of length 23 bits (M)
0	1000 1001	111 1000 0000 0000 0000 0000

(b) What is an excitation table ? Draw the characteristic table and excitation table for S-R and J-K flip-flops. 8

(c) Write the differences between the following : 6

(i) LCD and LEDs

(ii) Impact printers and Non-impact printers

3. (a) What is an Interrupt ? Explain interrupt driven I/O technique with the help of a diagram. 6

(b) Explain instruction pipelining with the help of a diagram. 6

(c) Explain any *four* addressing modes of 8086 microprocessor with the help of an example of each. 8

4. (a) Explain the functioning of 3 × 8 decoder. Draw its truth table and explain its logic diagram. 8

(b) Differentiate between .com programs and .exe programs. 6

(c) How can interleaved memory be used to improve the speed of main memory access ? Explain with the help of an example/diagram. 6

5. (a) Write a program using 8086 assembly language that converts a binary value stored in a byte location (assume value between 0 to 9) to equivalent ASCII digit. 8

(b) Why is memory hierarchy created in a computer system ? Explain memory hierarchy with the help of a diagram. 6

(c) For the following values of various registers in an 8086 microprocessor, compute the physical memory address : 6

(i) CS : IP = 0FABh : 01FAh

(ii) SS : SP = 1F0Ah : 0267h

(iii) DS : Offset : A11Ah : 0565h

× × × × ×