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**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%*

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

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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  $256 \text{ K} \times 4$  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  $3 \times 8$  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

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