

**POST GRADUATE DIPLOMA IN
COMPUTER APPLICATIONS
(PGDCA—NEW)**

Term-End Examination

December, 2024

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 the remaining question no 2 to question no. 5.*

1. (a) Explain Von Neumann Architecture with the help of a diagram. 5
- (b) Perform the following conversions : 5
 - (i) Decimal $(384)_{10}$ to Binary
 - (ii) Decimal $(873)_{10}$ to Hexadecimal
 - (iii) Hexadecimal $(B1D)_h$ to Octal

- (iv) ASCII string “ASCII to UTF” to UTF 8
- (v) Octal $(670)_8$ to Decimal
- (c) Differentiate between SRAM and DRAM. 5
- (d) Explain Associative cache mapping with the help of an example. 5
- (e) What is the need of RISC processor ? How large register file in RISC is useful for procedure calls ? Explain with the help of a diagram. 5
- (f) What is DMA ? How does DMA differ from I/O processor ? Explain the importance of DMA with the help of a diagram. 5
- (g) What is interrupt 21h in the context of 8086 microprocessor ? Explain the use of interrupt 21h, with the help of an example. 5
- (h) What are segment registers ? Discuss the utility of all four segment registers of 8086 microprocessor. 5
2. (a) Simplify the function $F(A, B, C) = \sum (0, 1, 3, 4, 5, 6)$ using k-map. Also, draw the circuit using NAND gates. 5

- (b) Explain the functioning of 3×1 multiplexer. Draw its truth table and explain its logic diagram with the help of an example input.

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- (c) Explain the working of J-K flip-flop with the help of logic diagram and characteristic table. Also, explain the excitation table of J-K flip-flop.

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3. (a) Explain the concept of Programmed I/O. How does programmed I/O technique differ from interrupt driven I/O ? Under what situations, it is better to use programmed I/O over interrupt driven I/O ?

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- (b) What is the aim of disk scheduling algorithm ? Briefly discuss the following disk scheduling algorithms :

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(i) FCFS

(ii) SSTF

(iii) SCAN

(iv) C-SCAN

(v) LOOK

- (c) What are Solid State Devices (SSD) ? How do SSD differ from HDD ?

5

4. (a) Explain the following addressing modes, with the help of suitable diagram (showing content of sample memory and registers) :

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- (i) Index Addressing
- (ii) Base Register addressing

Note : Your diagram should include instructions, operands and addresses.

- (b) Explain the working of microprogrammed control unit with the help of a suitable diagram. 10

5. (a) Write a program using 8086 assembly language that adds two binary numbers (assume the numbers are of byte type) stored in consecutive memory locations. The result of the addition and carry, if any are also stored in memory locations. Also explain its each step of execution. 5

- (b) Write short notes on following : $3 \times 5 = 15$

- (i) Instruction pipeline
- (ii) Multiprocessor
- (iii) Multiport memory

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