Time: 3 Hours   Max. Marks: 100

General Instructions:

IMP: *Verify that you have received the question paper with the correct course, code, branch etc.*

1. *This Question paper comprises of **three Sections -A, B, & C.** It consists of Multiple Choice Questions (MCQ's) & Subjective type questions.*

2. *Maximum marks for each question are indicated on right -hand side of each question.*

3. *Illustrate your answers with neat sketches wherever necessary.*

4. *Assume suitable data if necessary.*

5. *Preferably, write the answers in sequential order.*

6. *No sheet should be left blank. Any written material after a blank sheet will not be evaluated/checked.*

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SECTION A   20

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1. Attempt all parts:-

1-a.   Brain of computer is _____. (CO1)   1

    (a) Control unit

    (b) Arithmetic and Logic unit

    (c) Central Processing Unit

    (d) Memory

1-b.   _____ bus arbitration approach uses the involvement of processor. (CO1)   1

    (a) Centralized

    (b) Distributed

    (c) Randomized

    (d) All of the mentioned

1-c.   One way to make an adder to perform subtraction is by _____. (CO2)   1

    (a) Inverting the output

    (b) Inverting the carry-in

    (c) Inverting the B inputs

(d) Grounding the B inputs

1-d.   For a 4-bit parallel adder, if the carry-in is connected to a logical HIGH, the   1
result is _____. (CO2)

(a) The same as if the carry-in is tied LOW since the least significant carry-in is ignored

(b) That carry-out will always be HIGH

(c) A one will be added to the final result

(d) The carry-out is ignored

1-e.   Which of the following is fastest memory? (CO3)   1

(a) Secondary memory

(b) Auxiliary memory

(c) Cache memory

(d) Virtual memory

1-f.   The instruction JUMP belongs to _____. (CO3)   1

(a) Data transfer instruction

(b) Branch instruction

(c) Logical instruction

(d) Arithmetic instruction

1-g.   Which interrupt is non-maskable? (CO4)   1

(a) RST 7.5

(b) RST 5.5

(c) TRAP

(d) INTR

1-h.   How many types of modes are present in I/O Data Transfer? (CO4)   1

(a) 3

(b) 2

(c) 5

(d) 4

1-i.   _____ have been developed specifically for pipelined systems. (CO5)   1

(a) Utility software

(b) Speed up utilities

(c) Optimizing compilers

(d) None of the mentioned

| 1-j. | Which of the following page replacement algorithms suffers from Belady's Anomaly? (CO5) | 1 |

(a) Optimal replacement

(b) LRU

(c) FIFO

(d) Both optimal replacement and FIFO

2. Attempt all parts:-

2.a.	Define system bus. (CO1)	2
2.b.	What is an overflow? (CO2)	2
2.c.	Explain the functionality of RAM chip. (CO3)	2
2.d.	Explain software interrupts. (CO4)	2
2.e.	What are the different factors that can affect the performance of pipeline system? (CO5)	2

SECTION B   **30**

3. Answer any <u>five</u> of the following:-

3-a.	Explain input-output subsystems and control unit in computer system. (CO1)	6
3-b.	What are the various addressing modes available in computer system? Explain with example. (CO1)	6
3-c.	Explain the Signed magnitude multiplication algorithm with the help of flow chart. (CO2)	6
3-d.	Perform multiplication of (-9) with (-13) using booth's algorithm. (CO2)	6
3-e.	Explain the concept of hierarchical memory organization with the help of diagram. (CO3)	6
3-f.	What is DMA? Explain DMA transfer in a computer system with the help of diagram. (CO4)	6
3-g.	Describe the basic concept of Pipelining. Write any two Disadvantages of Pipelining. (CO5)	6

SECTION C   **50**

4. Answer any <u>one</u> of the following:-

| 4-a. | Explain various functional blocks of a computer in detail with block diagram. (CO1) | 10 |
| 4-b. | Explain Applications of Multiplexer in details. (CO1) | 10 |

5. Answer any <u>one</u> of the following:-

| 5-a. | What is IEEE 754 Floating point representation? Explain single-precision and double-precision Floating point representation with example. (CO2) | 10 |

| 5-b. | Draw the architecture of 8086 microprocessor and explain it also. (CO2) | 10 |

6. Answer any <u>one</u> of the following:-

| 6-a. | What is cache memory? Explain various mapping techniques available in cache memory. (CO3) | 10 |

| 6-b. | What are the three types of instruction format? Explain in details with example. (CO3) | 10 |

7. Answer any <u>one</u> of the following:-

| 7-a. | What are the various I/O transfers? Explain I/O device interface with block diagram. (CO4) | 10 |

| 7-b. | Why Handshaking is required in asynchronous data transfer? Explain. (CO4) | 10 |

8. Answer any <u>one</u> of the following:-

| 8-a. | What is Parallel processing? Also differentiate between pipelining and parallel processing. (CO5) | 10 |

| 8-b. | What is Concurrent access to memory and cache coherency? Explain in detail. (CO5) | 10 |