B1.4-R3: COMPUTER ORGANISATION

NOTE:

1. There are **TWO PARTS** in this Module/Paper. **PART ONE** contains **FOUR** questions and **PART TWO** contains **FIVE** questions.

2. **PART ONE** is to be answered in the **TEAR-OFF ANSWER SHEET** only, attached to the question paper, as per the instructions contained therein. **PART ONE** is **NOT** to be answered in the answer book.

3. Maximum time allotted for **PART ONE** is **ONE HOUR**. Answer book for **PART TWO** will be supplied at the table when the answer sheet for **PART ONE** is returned. However, candidates, who complete **PART ONE** earlier than one hour, can collect the answer book for **PART TWO** immediately after handing over the answer sheet for **PART ONE**.

TOTAL TIME: 3 HOURS **TOTAL MARKS: 100**
(PART ONE – 40; PART TWO – 60)

PART ONE
(Answer all the questions)

1. Each question below gives a multiple choice of answers. Choose the most appropriate one and enter in the "tear-off" answer sheet attached to the question paper, following instructions therein. **(1x10)**

1.1 Instruction and data during execution reside in the
A) Auxiliary memory
B) Processor memory
C) Cache memory
D) Primary memory

1.2 RAM is
A) Read write memory
B) Volatile memory
C) Random access memory
D) All of the above

1.3 Which of the following term is not associated with the magnetic tape
A) EOT
B) BOT
C) IBG
D) None of the above

1.4 Magnetic disks
A) has spirals
B) are read only devices
C) have data recorded in form of magnetized and non magnetized spots
D) are sequential access device

1.5 A magnetic disk having 80 tracks, 15 sectors per track and storing 512 bytes per sector will have a storage capacity of
A) 720KB
B) 360 KB
C) 1.4 MB
D) None of the above

1.6   The storage capacity of a Optical Disk is determined using
A)   Number of recording surface, number of tracks per surface, number of sectors per track
B)   Number of tracks on disk
C)   Number of sectors and bytes per sector
D)   Number of recording surface, number of tracks per surface, number of sectors per track and number of bytes per sector

1.7   Memory is organized into hierarchical way because
A)   CPU cannot access main memory directly
B)   Main memory cannot store large amount of data
C)   Use of auxiliary storage increases speed of computation
D)   None of the above

1.8   Data backup is taken
A)   To safeguard data in case of catastrophic eventualities
B)   To use the data set again and again
C)   To supply data at high rate
D)   None of the above

1.9   Which device uses laser beam technology to read and write data?
A)   Magnetic devices
B)   Optical devices
C)   Charged devices
D)   None of the above

1.10   Which of the following is not fitting with others?
A)   Trackball
B)   Joystick
C)   Mouse
D)   Web Cam

2. **Each statement below is either TRUE or FALSE. Choose the most appropriate one and ENTER in the "tear-off" sheet attached to the question paper, following instructions therein.** **(1x10)**

2.1   CISC has variable-length instruction format.

2.2   In a Karnaugh map of four variables A, B, C and D, the term AB will cover a strip of two squares.

2.3   A Register is a sequential circuit.

2.4   Programmable logic device is a combinational circuit.

2.5   I/O bound I/O is a preferred I/O scheme.

2.6   Un-normalized floating point representation is redundant in the sense that same number can be represented is more than one ways.

2.7   In 1's complement system there are two representations of zero.

2.8   There does not exist any computer with stack organized CPU.

2.9   The functions performed by a CPU are defined by its instruction set.

2.10 Vertical micro instructions, in microprogrammed control organization, has little encoding of the control information.

3. **Match words and phrases in column X with the closest related meaning/ word(s)/phrase(s) in column Y. Enter your selection in the "tear-off" answer sheet attached to the question paper, following instructions therein.** **(1x10)**

	X		Y
	X		**Y**
3.1	A circuit that converts n-bit binary input to 2^n unique output	**A.**	Printers
3.2	If carry into the sign bit position and carry out of the sign bit positions of binary integers are not equal then we have	**B.**	Application software drawing applications hard copy
3.3	Hand Hold scanners	**C.**	RISC
3.4	Single-cycle instruction execution	**D.**	Cache Memory
3.5	Output printed through a printer is referred to as	**E.**	Are used for scanning books
3.6	Array processor	**F.**	Index mode
3.7	Used by CPU to store instructions that are repeatedly required to run program, improving the overall system speed	**G.**	Zero address
3.8	High quality, high speed, high volume and non-impact are terms associated with	**H.**	One address
3.9	The addressing mode used for getting the address of an element of an array	**I.**	Application software
3.10	PUSH A POP A	**J.**	SIMD overflow
		K.	Decoder
		L.	Multiplexor

4. **Each statement below has a blank space to fit one of the word(s) or phrase(s) in the list below. Enter your choice in the "tear-off" answer sheet attached to the question paper, following instructions therein.** **(1x10)**

A.	Virtual memory	**B.**	Unified cache	**C.**	Parallel computers
D.	8085	**E.**	LRU	**F.**	8086
G.	FIFO	**H.**	Simultaneous	**I.**	Serial
J.	One byte	**K.**	Memory hazard	**L.**	Register transfer language
M.	Fourteen	**N.**	Split cache	**O.**	Standardized

4.1   The cache policy used for removing the page which is immediately previously used is _____.

4.2   The memory segmentation is used in the microprocessor _____.

4.3   The size of main memory is less than the size of _____.

4.4   C/S memory access stands for concurrent and _____ access.

4.5   Flynn's categorization is used for describing _____.

4.6   The size of zero address instruction is _____.

4.7   Read after write is a type of _____.

4.8   The number of address lines used to access 16K memory is _____.

4.9   _____ is used to represent the data transfer between registers.

4.10   The data cache and instruction cache are separate in _____.

PART TWO
(Answer any **FOUR** questions)

5.
a) Write an assembly language program to display Hello World.
b) What is meant by assembler directive? Explain the functioning of any four assembler directive.

(7+8)

6.
a) Draw the combinational circuit diagram of 4:1 multiplexer using AND, OR, NOT gates. Using it draw a block diagram of 8:1 multiplexer.
b) Perform the indicated operations in binary system using 2's complement arithmetic
$$(-17)_{10} + (-16)_{10}$$
$$(-17)_{10} - (-16)_{10}$$
c) Using multiplexers give the design of 4 bit arithmetic circuit.

(6+4+5)

7.
a) Explain the various instruction formats of Basic Computer.
b) 'The interrupt cycle of a basic computer is hardware implementation of branch and save return address' Explain.
c) What do you mean by instruction set completeness, for a computer?

(6+6+3)

8.
a) Explain the working of DMA transfer mechanism.
b) Write Booths algorithm to multiply two fixed point binary numbers.
c) Explain direct mapping scheme for mapping cache memory address.

(6+6+3)

9. Write short notes on the following:
a) Virtual Memory
b) Network Card
c) Tri-state Bus Buffers

(5x3)