Total No. of questions : 6] Roll No. .....

B.Tech (CS/DSML/Cyber Forensic) IV Sem.(Regular & Ex.)
End-Term Examination, May-June-2022

COMPUTER SYSTEM ORGANIZATION
(CSL-0458)

Time: 03:00 hours Max. Marks:40

Note : Attempt all questions.

		Marks	CO
1.1	What should be the status of ALE signal in 1st clock period of a machine cycle & why?	1	CO1
1.2	How many general purpose registers does 8086 have? Explain all of them with their functionality. **OR** Memory of 8086 is divided into segments. How many segments does 8086 have and what are they used for? What is the size of each segment?	2	CO1
1.3	How many formats of writing an instruction are there in 8086? Explain the function of each field in a 2 byte instruction. **OR** Complete the following code that adds two numbers fetched from memory of 8086 microprocessor from data segment with base address 2000H & offset of 1600H and from extra segment with Base address 1000 more than data segment with offset as 2000H . (Fill the Blanks)	3	CO1 , 3

```
MOV AX, ……
MOV DS, AX
MOV ……, 1600 H
MOV AX, ……
MOV …… , AX
MOV DI, 2000H
MOV AX, ……
ADD …… , [DI]
HLT
```

2.1	Decode the given instruction & write a control function for the same in RTL A memory address register loads the address in register R2 in one clock period. In the same clock period lower byte from a 16 bits register R1 is transferred to accumulator. Assume all register transfers are clock		

driven and are controlled by a control function. Make necessary assumptions if needed. 1 CO 2,3

2.2 A system architect is assigned a task to design 8 bits bus for data transfer. He is required to purchase the hardware from the market. What al hardware should he procure? Help architect to make the purchase.

OR 2 CO1,3,4

Perform the multiplication 7X3 using Booth's Multiplication algorithm.

2.3 Design a 4 bits arithmetic circuit and list all the functions it can perform with the help of truth table. 3 CO4,5,6

OR

What is the use of shift registers? If you are using signed numbers, which shift microperations must be used & why? How an overflow is verified in arithmetic lift shift operation?

11:32

3.1 What are the functions of an interface module 1 CO1

3.2 A computer system is reading an input from a peripheral byte by byte. Detail the stepwise signal descriptions of I/O interface that is needed to perform the action. Support your answer with appropriate diagram.

OR 2 CO1

What methods of data transfer are used when data is sent asynchronously? Explain all modes with suitable diagrams.

3.3 11:45 A character of 16 bits is to be transmitted using synchronous & asynchronous modes of data transfer. How many bits will the character have using 1. Synchronous transmission 2. Asynchronous transmission with 2 stop bits 3 CO5,6

OR

Design a 4x4 FIFO buffer and explain the data transfer from I/P to O/P

12:00

4.1 What are the key characteristics of a computer memory system 1 CO1

4.2 A Primary memory of size 512 KX8 is arranged in two memory banks format to make a memory of size 512KX16. How many address & data lines are required to read & data word from this memory 19, 16

OR 2 CO1,2,4

On what principle does associative memory works? Explain the block diagram & working of associative memory.

4.3 A Ram chip of size 256X8 & ROM chip of size 1024X8 is given to you to design a memory of 2KB RAM & 4 KB of ROM. How many RAM & ROM IC's you will need to design the desired memory

OR

Write a note on cache memory. Discuss various mapping techniques used to access data from cache memory with their advantages & disadvantages. **3** CO1,4,5,6

5.1 What principle of pipelining helps to achieve the speed up in creating an instruction **1** CO1

5.2 Write a note on categories of Flynn's Classification for process architectures.

OR

What types of hazards are encountered by an instruction pipeline. **2** CO1

5.3 100 tasks are to be created using a 4 stage pipeline with processing time of each stage as 20 nano second. How much time a pipelined system & a non pipelined system would take to complete the tasks. Comment on the performance of both the systems

OR

What different architectures exist for a MIMD computer system? Explain all of them with supporting diagrams. **3** CO1,4

6. What is an addressing mode? How many odes of addressing data from memory exist? Write about all the modes with suitable examples w.r.t 8086 microprocessor.

OR

A Virtual memory system has an address space of 8K words, memory space of 4K words & page & block sizes of 1K words. The following page reference charges occur during a given time interval.

4,2,0,1,2,6,1,40,1,0,2,3,5,7 determine the four pages that one resident in main memory after each page reference change if the replacement algorithm used is 1. FIFO 2. LRU **10** CO1,3,4
