

III B. Tech I Semester Regular/Supplementary Examinations, October/November - 2019 COMPUTER ARCHITECTURE AND ORGANIZATION

(Common to Electronics and Communication Engineering, Electronics and Instrumentation Engineering) Time: 3 hours Max. Marks: 70 Note: 1. Question Paper consists of two parts (Part-A and Part-B) 2. Answer ALL the question in Part-A 3. Answer any FOUR Questions from Part-B PART –A (14 Marks) How to improve the clock rate of processor? 1. a) [2M] b) Write about relative addressing. [2M] c) What is back patch policy? How it is used in indexed addressing? [2M] Write the responsibilities of PCI bus in computer system. d) [3M] e) What is the role of disk controller in secondary storage? [3M] f) Discuss instruction execution steps. [2M] (54 Marks) PART –B With neat sketch explain the blocks of computer system and the way they 2. [7M] a) communicate with each other. Explain various milestones in the development of generations of computers and its b) [7M] hardware. 3. How to execute instructions using straight line sequencing and branching? Give a) [7M] example. X=10001, Y=32. Perform various shift and rotate operations on X and Y and b) [7M] explain. 4. Write an assembly program and explain the instructions for finding matrix a) [7M] multiplication. What is the format of arithmetic instruction in assembly language? Elaborate b) [7M] variants of OP code in it. 5. Write and explain the characteristics and addressing issues of USB device. [7M] a) How to handle simultaneous interrupts using daisy chaining and priority? Explain b) [7M] in detail. 6. Describe the working principle of flash memory and read only memories with a) [7M] applications. Compare the operations of write-through protocol, copy-back protocol and early [7M] b) restart protocol of cache memory. 7. Explain the following. [14M] i) Single bus organization of the data path inside a processor.

ii) Micro program sequencing.



[14M]

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PART –A (14 Marks)

1.	a)	What is the role of optimizing compiler?	[2M]
	b)	Write about additional considerations in additional addressing modes.	[2M]
	c)	Write steps to find branch target address.	[2M]
	d)	How interrupts are used for control transfer between programs?	[3M]
	e)	Differentiate RAM and ROM.	[3M]
	f)	Define micro programmed control.	[2M]
		<u>PART –B</u> (54 Marks)	
2.	a)	A=A+B*60. Explain the role of general-purpose registers in executing this instruction.	[7M]
	b)	What is system software? Explain its functionalities in detail.	[7M]
3.	a)	What is the significance of addressing modes? Explain Direct, Immediate and relative addressing modes with examples.	[7M]

- b) How to use registers for parameter passing? Explain with subroutine instructions. [7M]
- 4. a) Discuss every field of instruction format and also register structure. [7M]
 b) Describe the role of I/O operations in reading a line of characters and displaying it [7M] with help of assembly pseudo code.
 5. a) What is PCI bus? How a read operation is performed with different data transfer [7M]
- 5. a) What is PCI bus? How a read operation is performed with different data transfer [7M] signals? Explain in detail.
 - b) What are the differences between synchronous bus and asynchronous bus? Explain. [7M]
- a) What is an Optical disk? How it can be used to support large storage in computer [7M] system? Explain.
 b) Explain different memory allocation techniques used in cache memory. [7M]
- 7. Explain the following:
 i) Role of MDR in fetching a word from memory.
 ii) Control sequence that implements unconditional branch instructions.



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ii) Input and output gating of ALU.



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ii) Vertical /horizontal organization of micro instructions.
