Code No: R1631041 **R16** SET - 1

III B. Tech I Semester Regular/Supplementary Examinations, March – 2021

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**

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PART –A (14 Marks)

1.	a)	What is a Big – Endian and Little- Endian representation?	[2M]
	b)	What do you mean by assembler directives?	[2M]
	c)	What is bit pair recoding? Give an example.	[2M]
	d)	What is PCI bus?	[3M]
	e)	Define Memory Access time and memory cycle time.	[3M]
	f)	Define micro routine and micro instruction.	[2M]

PART –B (56 Marks)

2.	a)	Discuss the design of a basic computer.	[7M]
	b)	Compare single bus structure and multiple bus structure with examples.	[7M]
3.	a)	List out the various Shift and Rotate Instructions with examples.	[7M]
	b)	What do you mean by assembly language? Write an assembly language program to read two values and perform an arithmetic operation on it.	[7M]
4.	a)	Perform the arithmetic operations (+42)+(-13) and (-42)-(-13) in binary using signed 2's complement representation for negative numbers.	[7M]
	b)	Explain how Index addressing mode, Immediate addressing mode and Relative addressing mode work?	[7M]
5.	a)	Explain the different methods used for handling the situation when multiple interrupts occurs.	[7M]
	b)	Explain the following: i) interrupt controller ii) polling iii) Enabling and Disabling Interrupts.	[7M]
6.	a)	Describe any six ways of improving the cache performance.	[7M]
	b)	Discuss about Magnetic Hard Disks.	[7M]
7.	a)	Explain the difference between micro programmed control and hardwired control.	[7M]
	b)	Explain the design of Control unit with a neat diagram.	[7M]

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Code No: R1631041 **R16** SET - 2

III B. Tech I Semester Regular/Supplementary Examinations, March – 2021

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Time: 3 hours Max. Marks: 70

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2. Answer **ALL** the question in **Part-A**
3. Answer any **FOUR** Questions from **Part-B**

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PART –A (14 Marks)

1. a) Explain about Bus structure. [2M]
   b) What is indirect addressing mode? [2M]
   c) What is signed binary? Give example. [2M]
   d) What do you mean by memory mapped I/O? [3M]
   e) What do you mean by static memories? [3M]
   f) What are the features of the hardwired control? [2M]

PART –B (56 Marks)

2. a) Draw and explain the basic block diagram of a digital computer. Also list the different types of computers. [7M]
   b) What is Application Software? Explain with examples. [7M]

3. a) Explain the role of Stacks and Queues in computer programming equation. [7M]
   b) List and explain different instruction formats. [7M]

4. a) Explain the algorithms for performing arithmetic operations with decimal data. [7M]
   b) With examples explain the Branch type instructions. [7M]

5. a) Explain the Direct Memory Access. How it improves the performance of the system? [7M]
   b) Distinguish between Synchronous Bus and Asynchronous Bus. [7M]

6. a) Discuss the different mapping techniques used in cache memories and their relative merits and demerits. [7M]
   b) How can you enhance the speed and capacity of memories? Explain. [7M]

7. a) Explain the concept of micro programmed control unit. [7M]
   b) Formulate a mapping procedure that provides eight consecutive micro instructions for each routine. The operation code has 7 bits and control memory has 2048 words. [7M]

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Code No: R1631041 **R16** SET - 3

III B. Tech I Semester Regular/Supplementary Examinations, March – 2021

COMPUTER ARCHITECTURE AND ORGANIZATION

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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**

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PART –A (14 Marks)

1. a) What are the basic functional units of a computer? [2M]
   b) Define auto increment mode of addressing? Give example. [2M]
   c) What are the logic instructions? [2M]
   d) Write the factors to be considered in designing an I/O subsystem. [3M]
   e) Define Hit and Miss. [3M]
   f) Name some register output control signals. [2M]

PART –B (56 Marks)

2. a) What is a System Software? Explain with examples. [7M]
   b) Write briefly about the evolution of a Computer Architecture. [7M]

3. a) Explain three-address, two-address, one-address, and zero-address instructions with an example. [7M]
   b) Write register transfer instructions for the following bit operations: [7M]
   i) Select complement, ii) Select clear, iii) Insert, iv) Right circular shift.

4. a) Explain the design of a 4-bit Arithmetic unit with two selection variables, which performs the basic arithmetic functions. [7M]
   b) Define addressing modes. What are the different types of addressing modes? Explain them with examples. [7M]

5. a) What is an I/O Interface? What are the functions of typical I/O interface? Explain. [7M]
   b) Discuss the DMA operation with neat diagram in detail. [7M]

6. a) What are the various semiconductor memories available? Explain. [7M]
   b) Write short notes on Optical Disks. [7M]

7. a) Discuss the Fundamental Concepts of Register Transfers. [7M]
   b) Explain in detail various fields of micro-instruction format with a neat diagram. [7M]

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Code No: R1631041 **R16** SET - 4

III B. Tech I Semester Regular/Supplementary Examinations, March – 2021

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**

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PART –A (14 Marks)

1. a) Give the basic performance equation. [2M]
   b) What is the difference between Stack and Queue? [2M]
   c) List the basic instruction types. [2M]
   d) Why I/O devices cannot be directly connected to the system bus? [3M]
   e) Write the formula for the average access time experienced by the processor in a system with two levels of caches. [3M]
   f) What are the factors that determine the control signals? [2M]

PART –B (56 Marks)

2. a) Explain the various Data types that are represented in computers with example. [7M]
   b) Explain various historical developments in computer architecture with respect to its performance improvement. [7M]

3. a) With a neat diagram, describe the various registers in a typical CPU. [7M]
   b) Write an assembly language program to count odd numbers of 1 to 100. [7M]

4. a) Explain various I/O operations used to perform read and write operations. [7M]
   b) Multiply the following pair of signed 2's complement number using Booth multiplication Algorithm: [7M]
      A = 010111
      B = 101100.

5. a) Write the factors considered in designing an I/O subsystem and explain them. [7M]
   b) Define the following: [7M]
      i) Interrupt, ii) Priority Interrupt, iii) Interrupt Hard ware.

6. a) Write notes on Internal organization of ROM memories. [7M]
   b) Write short notes on secondary storage devices. [7M]

7. a) What are the two approaches used for generating the control signals in proper sequence? Explain any one. [7M]
   b) Explain address sequencing in micro programmed control unit. [7M]

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