

III B. Tech I Semester Regular Examinations, October/November - 2018**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

1. a) Define digital computer? Describe the type of computers. [2M]
- b) What are four types of operations performed by computer instructions? [2M]
- c) Write a note on register operands of an arithmetic instruction. [2M]
- d) Define interrupt and interrupt service routine. [3M]
- e) Discuss briefly about read only memory. [3M]
- f) Describe the timing of the control signal during the Add step. [2M]

PART -B

2. a) Draw the connections between the processor and main memory and explain the basic operational concepts. [7M]
- b) Write a note on arithmetic and logical unit. [7M]
3. a) Explain the following addressing modes i) Register mode ii) Immediate mode iii) Indirect mode iv) Absolute mode. [7M]
- b) Discuss briefly about Assembly language notations. [7M]
4. a) List the types of component instruction and explain it. [7M]
- b) Explain input/output operations of computer architecture. [7M]
5. a) Draw the input-output interface for an input device and explain accessing of input-output device. [7M]
- b) Discuss briefly about universal serial bus (USB). [7M]
6. a) Explain briefly about Associate-mapped and set-associate mapped cache. [7M]
- b) Write a short note on flash memory. [7M]
7. a) Draw and explain the hardwired control unit organization and encoding function. [7M]
- b) Define the term micro programmed control? Draw the basic organization of a micro programmed control unit and explain it. [7M]



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PART -A

1. a) Define program? Explain about the term input unit. [2M]
- b) Define and discuss about straight-line sequencing. [2M]
- c) Write a note on immediate operands of an arithmetic operands. [2M]
- d) Define interrupt-acknowledge signal and interrupt latency. [3M]
- e) Discuss briefly about PROM. [3M]
- f) What action are required for executing this instruction Add (R3),R1. [2M]

PART -B

2. a) Draw and explain single bus structure. [7M]
- b) Draw the functional unit of a computer and discuss about the control unit in details. [7M]
3. a) Explain the following addressing modes. [7M]
 i) Index mode ii) Auto increment mode iii) Auto decrement mode.
- b) Write a short note on rotate instructions. [7M]
4. a) Write a short note on branch instruction. [7M]
- b) Discuss briefly about secondary storage devices. [7M]
5. a) Discuss about Synchronous bus and draw the timing diagram of input transfer of synchronous bus. [7M]
- b) Discuss briefly about peripheral component interconnect (PCI). [7M]
6. a) Define locality of reference and explain use of a cache memory and direct – mapped cache. [7M]
- b) Write a short note on interleaving. [7M]
7. a) Define ALU? Explain the arithmetic and logical operation. [7M]
- b) Draw the microinstruction-sequencing organization of next-address field and explain it. [7M]



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PART -A

1. a) Describe the term memory unit. [2M]
- b) Define and discuss about instruction execute. [2M]
- c) Write a note on shifted immediate operand. [2M]
- d) Write a note on DMA. [3M]
- e) Discuss briefly about EPROM. [3M]
- f) Write the control sequence for execution of the instruction Add(R3),R1. [2M]

PART -B

2. a) Write about the history of development of the computer. [7M]
- b) Define system software? Discuss briefly about software and its processor time. [7M]
3. a) Discuss briefly about basic input/output operations. [7M]
- b) Write a note on shift instruction. [7M]
4. a) List and explain any three types of addressing modes of computer organization. [7M]
- b) What are logic Instructions? Explain. [7M]
5. a) Write a note on enabling and disabling interrupts. [7M]
- b) Discuss about Interface Circuits. [7M]
6. a) Draw and explain a block diagram of a 4M*32 memory unit using 1M*4DRAM chips. [7M]
- b) Write a short note on optical disks. [7M]
7. a) Write a short note on register transfers. [7M]
- b) Draw the flowchart of a micro program for the Add scr, Rdst instruction. [7M]



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**PART -A**

- |    |    |                                                                             |      |
|----|----|-----------------------------------------------------------------------------|------|
| 1. | a) | Define the term processor and discuss about output unit.                    | [2M] |
|    | b) | Discuss about Condition Register (CR) and Integer Exception Register (XER). | [2M] |
|    | c) | Write a note on condition codes for branch instruction.                     | [2M] |
|    | d) | Discuss about interrupt vector.                                             | [3M] |
|    | e) | Discuss briefly about EEPROM.                                               | [3M] |
|    | f) | Write the control sequence for an unconditional branch instruction.         | [2M] |

**PART -B**

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|----|----|-----------------------------------------------------------------------------------------------------------------------|------|
| 2. | a) | Discuss the basic aspects of computer performance.                                                                    | [7M] |
|    | b) | Draw and explain the Read and Write requests and timing diagram of a read operation of CPU and external bus transfer. | [7M] |
| 3. | a) | Explain the role of stack and queues in computer programming equation.                                                | [7M] |
|    | b) | Write a note on logic instructions.                                                                                   | [7M] |
| 4. | a) | Explain about Arithmetic Instructions                                                                                 | [7M] |
|    | b) | What is the significance of Addressing modes? Explain.                                                                | [7M] |
| 5. | a) | Define DMA and draw the two-channel DMA controller and explain it.                                                    | [7M] |
|    | b) | Draw and explain input/output interface circuit connecting a keyboard to an asynchronous bus.                         | [7M] |
| 6. | a) | Discuss briefly about basic memory circuits.                                                                          | [7M] |
|    | b) | Write a short note on magnetic hard disks.                                                                            | [7M] |
| 7. | a) | Discuss how to fetch a word from memory.                                                                              | [7M] |
|    | b) | Explain the microinstructions of the micro programmed control.                                                        | [7M] |

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