**Paper Id:** | **110322** |                    **Roll No:** | | | | | | | | | | | | |

## B. TECH.
## (SEM-III) THEORY EXAMINATION 2019-20
## COMPUTER ORGANIZATION AND ARCHITECTURE

*Time: 3 Hours*                                                              *Total Marks: 100*

**Note: 1.** Attempt all Sections. If require any missing data; then choose suitably.

### SECTION A

**1.**      **Attempt** *all* **questions in brief.**                        **2 x 10 = 20**

| Qno. | Question | Marks | CO |
|------|----------|-------|----|
| a. | Define the term Computer Architecture. | 2 | 1 |
| b. | Draw the basic functional units of a computer. | 2 | 1 |
| c. | Perform the 2's complement subtraction of smaller number (101011) from larger number (111001). | 2 | 2 |
| d. | What is the role of Multiplexer and Decoder? | 2 | 2 |
| e. | Write the differences between RISC and CISC. | 2 | 3 |
| f. | What are the types of microinstructions available? | 2 | 3 |
| g. | What is SRAM and DRAM? | 2 | 4 |
| h. | What is the difference between 2D and $2^{1/2}$ D memory organization? | 2 | 4 |
| i. | What is I/O control method? | 2 | 5 |
| j. | What is bus arbitration? | 2 | 5 |

### SECTION B

**2.**      **Attempt any** *three* **of the following:**

| Qno. | Question | Marks | CO |
|------|----------|-------|----|
| a. | Convert the following arithmetic expressions from infix to reverse polish notation:<br><br>  i.    A*B+C*D+E*F<br>  ii.   A*[B+C*CD+E]/F*(G+H) | 5+5 | 1 |
| b. | Design a 4-bit Carry-Look ahead Adder and explain its operation with an example. | 10 | 2 |
| c. | i.    Draw the timing diagram for a instruction cycle and explain.<br>ii.   Give a note on subroutine. | 5+5 | 3 |
| d. | What do you mean by virtual memory? Discuss how paging helps in implementing virtual memory. | 10 | 4 |
| e. | What is DMA? Describe how DMA is used to transfer data from peripherals. | 10 | 5 |

### SECTION C

**3.**      **Attempt any** *one* **part of the following:**

| Qno. | Question | Marks | CO |
|------|----------|-------|----|
| a. | Describe in detail the different kinds of addressing modes with an example. | 10 | 1 |
| b. | Discuss stack Organization. Explain the following in details-<br><br>  (i)     Register stack<br>  (ii)    Memory stack | 10 | 1 |

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**4.**      **Attempt any *one* part of the following:**

| Qno. | Question | Marks | CO |
|------|----------|-------|-----|
| a. | Represent the following decimal number in IEEE standard floating-point format in a single precision method (32-bit) representation method.<br>    i.     $(65.175)_{10}$<br>    ii.    $(-307.1875)_{10}$ | 5+5 | 2 |
| b. | Using Booth algorithm perform the multiplication on the following 6-bit unsigned integer 10110011 * 11010101 | 10 | 2 |

**5.**      **Attempt any *one* part of the following:**

| Qno. | Question | Marks | CO |
|------|----------|-------|-----|
| a. | What is parallelism and pipelining in computer Architecture? | 10 | 3 |
| b. | Explain the organization of Microprogrammed control unit in detail. | 10 | 3 |

**6.**      **Attempt any *one* part of the following:**

| Qno. | Question | Marks | CO |
|------|----------|-------|-----|
| a. | Discuss the different mapping techniques used in cache memories and their relative merits and demerits. | 10 | 4 |
| b. | RAM chip 4096 × 8 bits has two enable lines. How many pins are needed for the integrated circuits package? Draw a block diagram and label all input and outputs of the RAM. What is main feature of random-access memory? | 5+5 | 4 |

**7.**      **Attempt any *one* part of the following:**

| Qno. | Question | Marks | CO |
|------|----------|-------|-----|
| a. | Write down the difference between isolated I/O and memory mapped I/O. Also discuss advantages and disadvantages of isolated I/O and memory mapped I/O. | 10 | 5 |
| b. |     i.     Discuss the design of a typical input or output interface.<br>    ii.    What are interrupts? How are they handled? | 10 | 5 |