Paper Id:
 2
 3
 1
 9
 5

### B. TECH (SEM V) THEORY EXAMINATION 2022-23 COMPUTER ARCHITECTURE AND ORGANIZATION

Time: 3 Hours

Note: 1. Attempt all Sections. If require any missing data; then choose suitably.2. Any special paper specific instruction.

### SECTION A

### 1. Attempt *all* questions in brief.

- (a) Explain the Design Methodology.
- (b) Describe a stack pointer.
- (c) What is programmable logic devices?
- (d) Define control word.
- (e) Define Normalization of IEEE floating point representation.
- (f) What is coprocessor?
- (g) Explain the difference between horizontal organization and vertical organization.
- (h) What is multiprogramming?
- (i) Define VHDL. State the applications of VHDL.
- (j) Explain the difference between program and software.

# SECTION B

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

- (a) What are the components at processor design level in a computer system? Discuss various design issues at processor level.
- (b) Give the overview of CPU behavior using a flowchart. Also draw the block diagram for processor memory communication with and without cache.
- (c) Describe the design of a 4-bit carry look ahead adder.
- (d) Write a note on the virtual memory and  $2^{1/2}$  D memory organization.
- (e) Draw and explain simple queuing model of computer system.

# SECTION C

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

- (a) Explain the concept of stack organization.
- (b) Represent the floating point in the IEEE standard format for the given number  $1.00010100 \times 2^{-10}$ .

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

- (a) What do you mean by the structure and behavior of a system? Give the behavioral VHDL description of half adder.
- (b) What is meant by nano programming? How does control unit of a computer function? Explain with the help of block diagram.

### QP23DP1 290 | 27-01-2023 13:30:28 | 117.55.242.132

Roll No.

 $2 \ge 10 = 20$ 

Total Marks: 100

 $10 \ge 3 = 30$ 

 $10 \ge 1 = 10$ 

 $10 \ge 1 = 10$ 

PAR SP

# Explain how Booth's algorithm is suitable for signed number multiplication.

- (a) Perform the multiplication of the following using Booth algorithm (01110) + 14x - 5 (11011).
- Explain the Daisy chaining mechanism for bus arbitration. Analyze the three (b) bus arbitration methods-Daisy chaining, parallel and independent requesting with respect to communication reliability in the event of hardware failures

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

6.

- (a) How a negative number is represented using 1's complement and 2's complement. Discuss the advantages and disadvantages of each representation.
- (b) Write short notes on
  - (i) Data processing and Data movement
  - (ii) Encoder and Decoder
  - (iii) RISC and CISC
  - (iv) Virtual address and Physical address
  - (v) Multiplexer and De-multiplexer

- Differentiate between Hardwired control and Micro programmed control. (a)
  - Explain each method in detail. Write a program to evaluate the arithmetic statement  $X = (A+B) \times (C \times D)$ . Use (b)

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

Attempt any one part of the following:

an accumulator type computer with two address instruction.

# $10 \ge 1 = 10$

# 2.01.2023 3:30:281 11.55.242.132

 $10 \ge 1 = 10$