Printed pages: 02 Sub Code: RCS 302

Paper Id: 1 0 0 3 Roll No.

**B.Tech.**
**(SEM III) THEORY EXAMINATION 2017-18**
**COMPUTER ORGANIZATION & ARCHITECTURE**

***Time: 3 Hours*** ***Total Marks: 70***

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

## SECTION A

**1. Attempt *all* questions in brief. 2 x 7 = 14**

a. Draw the circuit diagram of D Flip Flop.
b. Write the difference between RAM & ROM.
c. Write short note on pipelining process.
d. Write the difference between serial & parallel communication.
e. Perform the following operation on signed numbers using 2's compliment method: $(56)_{10} + (-27)_{10}$
f. Write speed up performance laws.
g. Differentiate between Horizontal & Vertical microprogramming.

## SECTION B

**2. Attempt any *three* of the following: 7 x 3 = 21**

a. What is programmable logic device? List various techniques to program PLD. Explain any one technique with example.
b. (i) Draw the block diagram for a small Accumulator based CPU
(ii) How floating point numbers are represented in computer, also give IEEE 754 standard 32-bit floating point number format.
c. Draw the data path of sequential n bit binary divider. Give the non restoring division algorithm for unsigned integers. Also illustrate algorithm for unsigned integer with a suitable example.
d. What is micro programmed control unit? Give the basic structure of micro programmed control unit. Also discuss the microinstruction format and the control unit organization for a typical micro programmed controllers using suitable diagram.
e. What do you mean by locality of reference? Explain with suitable example.

## SECTION C

**3. Attempt any *one* part of the following: 7 x 1 = 7**

(a) Differentiate between RISC & CISC based microprocessor.
(b) Explain Booths multiplication algorithm in detail.

**4. Attempt any *one* part of the following: 7 x 1 = 7**

(a) Draw the Data path of 2's compliment multiplier. Give the Robertson multiplication algorithm for 2's compliment fractions. Also illustrate the algorithm for 2's compliment fraction by a suitable example.
(b) Describe Sequential Arithmetic & Logic unit (ALU) using proper diagram

**5. Attempt any *one* part of the following: 7 x 1 = 7**

(a) Give the structure of commercial 8MX 8 bit DRAM chip.
(b) Explain the working of DMA controller with help of suitable diagrams.

**6. Attempt any *one* part of the following: 7 x 1 = 7**

(a) What is hardwired control? List various design methods for hardwired control. Discuss in detail using diagram any one of the method for designing GCD processor.

(b) How pipeline performance can be measured? Discuss. Give a space time diagram for visualizing the pipeline behavior for a four stage pipeline.

**7. Attempt any *one* part of the following: 7 x 1 = 7**

(a) Discuss the various types of address mapping used in cache memory.

(b) A moving arm disc storage device has the following specifications:

| | |
|---|---|
| Number of Tracks per recording surface | 200 |
| Disc rotation speed | 2400 revolution/minute |
| Track-storage capacity | 62500 bits |

Estimate the average latency and data transfer rate of this device.