

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.