

B. Tech Degree IV Semester Examination, April 2010

CS 403 COMPUTER ARCHITECTURE AND ORGANIZATION (2006 Scheme)

Time: 3 Hours

Maximum Marks: 100

PART A (Answer ALL questions)

(8 x 5 = 40)

- I.
- a. List different types of instructions with examples.
 - b. Explain briefly any five addressing modes with examples.
 - c. What do you mean by grouping of control signals in micro programmed control? Explain.
 - d. Bring out any four comparison of hard wired and micro programmed control.
 - e. Write short notes on cache memory.
 - f. Brief on (i) Direct mapping (ii) Block set associative mapping.
 - g. What is
 - (i) I/O mapped I/O
 - (ii) Memory mapped I/O
 - (iii) Polling
 - (iv) Daisy chaiting
 - (v) Ventured interrupts
 - h. Briefly explain DMA.

PART B

(4 x 15 = 60)

- II.
- a. A given computer has 16 bit instructions. Operand addresses are specified using 6 bit fields. There are two operand, one operand and zero operand instructions. What are the maximum possible number of instructions for each type, that can be provided by this computer. Draw instruction formats for all three types of instructions. (9)
 - b. List the various registers used in a processor which help execution and explain function of each register (6)

OR

- III.
- a. Write short notes on
 - (i) Stack
 - (ii) Little endian
 - (iii) Big endian(3 x 2 = 6)
 - b. Draw and explain functional units of a computer as a block diagram. (9)

- IV. Explain restoring division with block diagram, algorithm and example. (15)

OR

- V.
- a. Explain with examples
 - (i) Skip-over is method
 - (ii) Bit pair recoding method. (6)
 - b. Explain briefly with examples
 - (i) normalizing
 - (ii) non-nenman rounding (4)
 - c. Multiply +13 and –6 using booth method (skip over is). (5)

(Turn over)



- VI. a. Explain virtual memory (10)
b. Write short notes on
(i) Memory interleaving
(ii) replacement algorithms
(iii) Static memory
(iv) dynamic memory (5)
- OR**
- VII. a. A block-set-associative cache consists of a total of 64 blocks divided into 4 block set. The main memory contains 4096 blocks, each block consisting of 128 words:
(i) How many bits are there in main memory address
(ii) How many bits are there in each of TAG, SET and WORD fields. (7)
- b. What is
(i) Page fault
(ii) hit ratio (3)
- c. Draw and explain the internal organization of a memory chip of 16×8 ($16 \text{ words} \times 8 \text{ bit}$) (5)
- VIII. What are I/O channels, explain
(i) Multiplexer
(ii) Selector type channels. (15)
- OR**
- IX. a. Explain
(i) Synchronous bus
(ii) Asynchronous bus (10)
- b. Write short notes on
(i) SCSI bus
(ii) USB. (5)