

End Semester Examinations - 2015-16 Even Semester - May 2016

14CS2005 Computer Architecture

Set A

Time : 3 hrs
Total Marks: 100

1. a. Draw the state diagram of an instruction cycle and explain each stage in detail. (15)
b. Explain transfer control of multiple interrupts with necessary diagram. (5)

OR

2. a. Compare and contrast associative and set associative mapping techniques used in cache memory with suitable diagrams. (15)
b. Discuss the cache replacement policies with examples. (5)

3. For eight bit word 00111001, the check bits stored with it would be 0111. Suppose when the word is read from memory, the check bits are calculated to be 1011.
What is the data word that was read from memory? (Calculate the data word that is read from the memory. Also explain the procedure for above calculation.) (20)

OR

4. a. Draw the flow diagram of programmed I/O and Interrupt driven I/O and state the difference between these two types. (15)
b. Explain the major task of Control logic in DMA with diagram. (5)

5. a. Draw and explain the general flowchart and algorithm for unsigned binary division. (10)

- b. Consider the following unsigned numbers:

Dividend : 147

Divisor : 11

Complete the division operation for the above two numbers and layout the procedure in a table. Explain the steps. (10)

OR

6. a. Given $x = 0111$ and $y = 1011$, compute the product of $p = x * y$ using Booth's algorithm. (15)

- b. List the types of Rotate and shift operations related to arithmetic operations. Draw the block diagram and explain the operations with necessary examples? (5)

7. a. Explain the following addressing modes with necessary example:

i). Relative Addressing Mode

ii). Base-Register Addressing Mode

iii). Indexing Addressing Mode
(15)

- b. List the types of X86 addressing modes and state the difference between X86 and ARM addressing modes. (5)

OR

8. a. Consider the following expression:

$$Y = (X - Y * Z) / (W + T * S)$$

Write the machine instructions to compute the above expression for the following : Two and Three address instructions (15)

- b. List out the elements of machine instruction and explain the instruction types. (5)

9. a. Draw the timing diagram and explain the procedure for instruction pipeline operation for 8 instructions (from I₁ to I₈). Also explain the data hazard with necessary example. (15)

- b. Explain the tasks performed by a micro programmed control unit. (5)

Wishing you All the Best
