Code : 051402

B.Tech 4th Semester Exam., 2016

COMPUTER ARCHITECTURE

Time : 3 hours *Full Marks* : 70

Instructions :

(i) The marks are indicated in the right-hand margin.

*(ii) There are **NINE** questions in this paper.*

*(iii) Attempt **FIVE** questions in all.*

*(iv) Question No. **1** is compulsory.*

1. Answer the following questions (any *seven*) : 2×7=14

(a) Write the range of decimal integer can be represented by *n*-bit 1's complement representation.

(b) What is zero address instruction format?

(c) What do you mean by interrupt-initiated I/O?

(d) What do you mean by cache coherence problem?

(e) How many 128 × 8 RAM chips are needed to provide a memory capacity of 2048 bytes?

(f) Briefly explain the conflicts in instruction pipeline.

(g) Explain the use of subroutine with the help of suitable example.

(h) What is a micro-operation? Explain the four categories of the most common micro-operations.

(i) Define hit ratio and explain its significance.

2. With neat block diagram, explain how DMA controller is initialized for DMA data transfer. 14

3. Discuss Flynn's classification of computer. 14

4. What is associative memory? Explain with the help of a block diagram. Also mention the situation in which associative memory can be effective utilized. 14

5. Discuss the different ways in which ROM can be programmed. 14

6. What is meant by pipelining? Why do we require instruction pipelining? Explain its working procedure. Discuss the pipeline performance measures. 14

7. A virtual memory system has an address space of 8 k words, memory space of 4 k words and page & block size of 1 k words. The following page reference changes occur during a given time interval :

   4, 2, 0, 1, 2, 6, 1, 4, 0, 1, 0, 2, 3, 5, 7

   Determine the four pages that are resident in main memory after each page reference change if the replacement algorithm used is *(i)* FIFO and *(ii)* LRU. 14

8. Explain the Strobe Control method of asynchronous data transfer. What are the disadvantages of this method? 14

9. Write short notes on the following : 7×2=14

   (a) Shift instructions

   (b) Daisy chaining priority

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