PAPER ID : 1067

TCS-401/TIT-401 Printed Pages : 3

Paper ID and Roll No. to be filled in your Answer Book

Roll No.

B.Tech.

(SEM. IV) (EVEN SEM.) EXAMINATION, 2013

COMPUTER ORGANIZATION

Time : 3 Hours] [Total Marks : 100

1 Attempt any four question : 4×5

(a) List the major components of computer organization and explain in detail.

(b) Explain the IEEE standard for floating point numbers with suitable examples.

(c) Explain the function of control unit and Instruction format in details.

(d) What is RISC? Draw and explain the Berkeley RISC I instruction format.

(e) Explain the importance of HOLD and HLDA pin data transfer through DMA.

(f) Draw the block diagram of multiprocessor and explain the role of cache coherence in processor.

2 Attempt any four questions : 4×5

(a) How many switch points are there in a crossbar switch network that connects p processor to m memory modules.

(b) Design an array multiplier that multiplies two 4-bit numbers by using AND gates and binary adders.

(c) What is the difference between isolated I/O and memory mapped I/O and also explains the advantages and disadvantages of each.

(d) Determine the number of clock cycles that it takes a process 200 tasks in a six segment pipeline.

(e) Calculate the address lines for 8 bytes memory.

(f) What are the basic difference between a branch instruction, a call subroutine instruction and program interrupt?

3 Attempt any two questions : **2×10**

(a) What is RTL? Represent the number $(+46.5)_{10}$ as a floating point binary number with 24 bits. The normalized fraction mantissa has 16 bits and the exponent has 8 bits.

(b) Explain the different arithmetic and logic micro-operations. Draw and discuss the 4-bit arithmetic circuit in detail.

(c) Explain the difference between hardwired and micro programmed control unit in detail.

4 Attempt any two questions : **2×10**

(a) Define addressing mode? Write the RISC I instruction in assembly language that will cause a jump to address 3200 if the Z (zero) status bit is equal to 1 by using immediate mode.

(b) What is instruction pipelining? Consider the multiplication of two 40 × 40 matrices using a vector processor. Find out how many product terms are there in each inner product and how many inner products must be evaluated.

(c) Define the mode of information transfer? Draw and explain the priority interrupt hardware by using four interrupt sources.

5 Attempt any two questions : **2×10**

(a) Draw and explain the block diagram of DMA controller and DMA transfer mechanism.

(b) Explain the various characteristic of multiprocessor? Construct a diagram for a 4 × 4 omega switching network. Show the switch setting required to connect input 3 to output 1.

(c) Explain memory hierarchy in a computer system? A digital computer has a memory unit of 64K × 16 and a cache memory of 1K words. The cache uses direct mapping with block size of four words. Find out the total numbers of bits in the tag, index, block and word fields of the address format.
