Code No: R31041 **R10** **Set No: 1**

III B.Tech. I Semester Supplementary Examinations, May - 2013

COMPUTER ARCHITECTURE & ORGANIZATION

(Electronics and Communication Engineering & Electronics and Instrumentation Engineering)

Time: 3 Hours **Max Marks: 75**

Answer any FIVE Questions

All Questions carry equal marks

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1. (a) Briefly explain the role of arithmetic and logic unit in a computer system. Give its block diagram.
   (b)What is a bus? What are the different buses in a CPU?

2. (a) Enumerate the actors which play an important role for selection of an instruction set for a machine.
   (b) Define 3-address,2-address,1-address,0 -address instruction with an example.

3. (a) What are micro operation? What are its various types ? Explain them.
   (b) Explain the Organization of Micro programmed control unit in detail.

4. Using Booth algorithm perform the multiplication on the following 6-bit unsigned integer 10110011 * 11010101

5. (a) Explain the concept of memory hierarchy with a diagram.
   (b) Describe the working principle of a typical magnetic disk.

6. (a) Design parallel priority interrupt hardware for a system with eight interrupt source.
   (b) Why does DMA have priority over the CPU when both request a memory transfer? Explain

7. (a) What is meant by cache coherence problem? Why does it occur?
   (b) Briefly explain about vector computations.

8. (a) What are multi processors? Give the characteristics of multiprocessors systems.
   (b) What is arbitration? List the differences between inter-process and inter-processor arbitration.

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Code No: R31041 **R10** **Set No: 2**

III B.Tech. I Semester Supplementary Examinations, May - 2013

COMPUTER ARCHITECTURE & ORGANIZATION

(Electronics and Communication Engineering & Electronics and Instrumentation Engineering)

Time: 3 Hours **Max Marks: 75**

Answer any FIVE Questions

All Questions carry equal marks

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1. (a) Describe the connections between the processor and memory with a neat structural diagram.
   (b) Write the general format for the Fixed point & floating numbers. Explain operations on them with examples.

2. (a) What is an instruction set? What are the elements of an instruction set? Explain each of them.
   (b) Registers R1 and R2 of a computer contain the decimal values 1200 and 4600. What is the effective address of the memory operand in each of the following instructions?
   (i) Load 20(R1), R5
   (ii) Add - (R2), R5

3. (a) Illustrate the implementation of each category of micro operations through block diagrams.
   (b) What is hardwired control? List the differences between hardwired control and micro programmed control?

4. Explain Booth multiplication (2's complement) algorithm and using this algorithm perform the multiplication on the following 6-bit unsigned integer 110011 * 101100.

5. (a) Explain the operation of Associative cache memories.
   (b) What is virtual memory? How is it implemented? Explain.

6. a) Draw the typical block diagram of a DMA controller and explain how it is used for direct data transfer between memory and peripherals.
   (b) What are advantages of using interrupt initiated data transfer over transfer under program control without interrupt?

7. (a) What are the symmetric multi processors? Give the diagram of typical symmetric multiprocessor. Explain its advantages and disadvantages.
   (b) Explain the state diagram of MESI protocol.

8. (a) Briefly explain the Flynn's classification of multiprocessors.
   (b) Compare and contrast loosely coupled multiprocessors and tightly coupled multiprocessors.

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Code No: R31041 **R10** **Set No: 3**

III B.Tech. I Semester Supplementary Examinations, May - 2013

COMPUTER ARCHITECTURE & ORGANIZATION

(Electronics and Communication Engineering & Electronics and Instrumentation Engineering)

Time: 3 Hours **Max Marks: 75**

Answer any FIVE Questions

All Questions carry equal marks

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1. (a) Explain How basic operation are done in integer representation and floating point representation?
   (b) Explain multiple bus organization in detail.

2. (a) What is addressing mode? Explain the different types of Addressing modes with suitable examples.
   (b) Explain the performance of pipelining.

3. (a) How does a micro program differ from a program? Explain with suitable examples.
   (b) What is micro programmed control? Explain the Organization of Micro programmed control unit in detail.

4. Write the algorithm for division of floating point numbers and illustrate with an example.

5. (a) Explain various mechanisms of mapping main memory address into cache memory addresses
   (b) Describe the organization of a typical RAM chip.

6. (a) Why is priority handling desired in interrupt controllers? How do the different priority schemes work?
   (b) What is an IOP? Outline the function performed by an IOP. Illustrate the architecture of an I/O channel.

7. What is multi threading? How is it done in multi processors? Briefly explain various approaches to multi threading.

8. (a) What are multi processor systems? Give the classification in them.
   (b) Compare and contrast inter process and inter processor arbitrations.

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Code No: R31041 **R10** **Set No: 4**

III B.Tech. I Semester Supplementary Examinations, May - 2013

COMPUTER ARCHITECTURE & ORGANIZATION

(Electronics and Communication Engineering & Electronics and Instrumentation Engineering)

Time: 3 Hours **Max Marks: 75**

Answer any FIVE Questions

All Questions carry equal marks

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1. (a) Draw the basic functional units of a computer. Explain them briefly.
   (b) What is the use of arithmetic and logic unit in computer system? Give the schematic symbol of Arithmetic Logic Unit. Explain various components in it.

2. (a) What do you mean by instruction cycle? What are various sub cycles in an instruction cycle? Explain each with a neat flowchart.
   (b) Registers R1 and R2 of a computer contains the decimal values 1200 and 2400 respectively. What is the effective address of the memory operand in each of the following instructions?
   i. Load 20(R1), R5
   ii. Add –(R2) , R5
   iii. Move #3000, R5
   iv. Sub (R1)+, R5

3. (a) Write a micro routine for addition where the source and destination operands are specified in indexed and register addressing modes, respectively.
   (b) Explain micro programmed control unit. What are the advantages and disadvantages of it.

4. Give the algorithm for multiplication of signed 2's complement numbers and illustrate with an example

5. (a) Explain how the virtual address is converted into real address in a paged virtual memory system.

   (b)What is mapping? and when do you apply the mapping techniques? Explain.

6. (a) Explain how DMA transfer is accomplished with a neat diagram.
   (b) List the functions of I/O interface.

7. What is non uniform memory access computer? How is different symmetric multi processor? Explain cache coherence in NUMA.

8. How inter-processor communication and synchronization is achieved in multi processors? Explain the role of shared memory in it.

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