

II B.Tech I Semester Supplementary Examinations, February 2008

COMPUTER ORGANIZATION

**(Common to Computer Science & Engineering, Information Technology
and Computer Science & Systems Engineering)**

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions

All Questions carry equal marks

1. (a) What is meant by normalization in floating point representation?. Why do need it? What is bias? What normalization is used in IEEE 754 standard? [10]
(b) Explain about NaN and denormalised numbers in IEEE 754 standards. [6]
2. Design a circuit to increment, decrement, complement and clear a 4 bit register using RS flip-flops. Explain the control logic. [16]
3. (a) What is a pipeline register. What is the use of it?. Explain in detail. [8]
(b) Why do we need some bits of current microinstruction to generate address of the next microinstruction. Support with a live example. [8]
4. (a) How many bits are needed to store the result addition, subtraction, multiplication and division of two n-bit unsigned numbers. Prove. [8]
(b) What is overflow and underflow. What is the reason?. If the computer is considered as infinite system do we still have these problems?. [8]
5. (a) What is a virtual memory technique? Explain different virtual memory techniques. [8]
(b) Explain how the technique of paging can be implemented [8]
6. Write short notes on the following:
(a) DMA Controller
(b) I O P
(c) I/O Devices [6+6+4]
7. (a) What is pipeline? Give the detailed picture of pipeline.
(b) Explain pipeline for floating point addition and subtraction. [8+8]
8. (a) Explain the working of 8 x 8 Omega Switching network.
(b) Explain the functioning of Binary Tree network with 2 x 2 Switches. Show a neat sketch [8+8]

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1. (a) Explain about sign magnitude and 2's complement approaches for representing the fixed point numbers. Why 2's complement is preferable.
(b) Give means to identify whether or not an overflow has occurred in 2s complement addition or subtraction operations. Take one example for each possible situation and explain. Assume 4 bit registers.
(c) Distinguish between tightly coupled microprocessors and tightly coupled Microprocessors. [16]
2. . Design a circuit to increment, decrement, complement and clear a 4 bit register using RS flip-flops. Explain the control logic. [16]
3. (a) What are the major design considerations in microinstruction sequencing?. [8]
(b) Explain about microinstruction sequencing techniques, specifically variable format address microinstruction. [8]
4. (a) How many bits are needed to store the result addition, subtraction, multiplication and division of two n-bit unsigned numbers. Prove. [8]
(b) What is overflow and underflow. What is the reason?. If the computer is considered as infinite system do we still have these problems?. [8]
5. Explain the following with applications for each:
 - (a) ROM
 - (b) PROM
 - (c) EPROM
 - (d) EEPROM. [4+4+4+4]
6. Explain the following:
 - (a) Asynchronous Serial Transfer
 - (b) Asynchronous Communication Interface [8+8]
7. (a) What is pipelining? Explain. [8]
(b) Explain four segment pipelining. [8]
8. (a) What are the different physical forms available to establish an inter-connection network? Give the summary of those. [6]

Code No: R059210505

Set No. 2

- (b) Explain time-shared common bus Organization [5]
- (c) Explain system bus structure for multiprocessors [5]

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1. (a) Describe Von Neumann and Harvard architectures.
(b) What is meant by graininess of computations. In which applications SIMD and MIMD architectures are useful. Give practical examples. [16]
2. Design a circuit for parallel load operation into one of the four 4-bit registers from a bus. Mention clearly control/selection bits and selection logic. Assume D flip-flops. [16]
3. (a) How do you map micro-operation to a micro instruction address. [8]
(b) Hardwired control unit is faster than microprogrammed control unit. Justify this statement. [8]
4. (a) How many bits are needed to store the result addition, subtraction, multiplication and division of two n-bit unsigned numbers. Prove. [8]
(b) What is overflow and underflow. What is the reason?. If the computer is considered as infinite system do we still have these problems?. [8]
5. (a) What is Locality of Reference? Explain [6]
(b) What is the need of Replacement Algorithms for a Cache Memory? Explain any two Cache Replacement Strategies. [10]
6. What are the different modes of data transfer? Explain each mode in detail. [16]
7. Explain the following in related with Vector Processing
(a) Super Computers
(b) Vector operations
(c) Matrix multiplication
(d) Memory interleaving [4+4+4+4]
8. (a) Explain the working of 8 x 8 Omega Switching network.
(b) Explain the functioning of Binary Tree network with 2 x 2 Switches. Show a neat sketch [8+8]

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1. (a) In order to find the mileage given by a bike we observe how many liters of oil is filled and how many kilometers it drove. The observation is carried for a day, a month and a year. Which of them represents the actual performance of the bike?. Similarly, we wanted to evaluate the performance of a computer. How are you going to do?. What are the performance measures used in general. [6]
(b) Represent 32.75 and 18.125 in single precision IEEE 754 representation. [10]
2. (a) Design a circuit transferring data from a 4bit register which uses D flip-flops to another register which employs RS flip-flops. [8]
(b) What are register transfer logic languages. Explain few RTL statement for branching with their actual functioning. [8]
3. (a) How do you map micro-operation to a micro instruction address. [8]
(b) Hardwired control unit is faster than microprogrammed control unit. Justify this statement. [8]
4. (a) How many bits are needed to store the result addition, subtraction, multiplication and division of two n-bit unsigned numbers. Prove. [8]
(b) What is overflow and underflow. What is the reason?. If the computer is considered as infinite system do we still have these problems?. [8]
5. (a) Explain how the Bit Cells are organized in a Memory Chip. [8]
(b) Explain the organization of a 1K x 1 Memory with a neat sketch' [8]
6. What are the different kinds of I/O Communication techniques? What are the relative advantages and disadvantages? Compare and contrast all techniques. [16]
7. (a) What is Flynn's classification? Categorize the different streams in it.
(b) Explain SIMD array processor prganization. [8+8]
8. (a) Explain the working of 8 x 8 Omega Switching network.
(b) Explain the functioning of Binary Tree network with 2 x 2 Switches. Show a neat sketch [8+8]
