Punjab Technical University
Master of Computer Application Examination

MCA 1st Semester Computer Fundamental 2006

Question1 is compulsory. Any three from the rest.

Question 1.

(a) Design a 4-bit shift register, which is capable of shifting its binary information in both the directions aloqs with the facility of parallel loading.

(b) Differentiate between a hardwired control unit and a micro programmed control unit.

(c) What is the difference between a memory mapped I/O and a peripheral mapped l/O ?

(d) Draw the circuit diagram of RS flip flop and explain its working.

(e) Differentiate between MISD and SISD classification of computers suggested by Flynn.

Question 2.

(1)Explain the direct and associative cache mapping.

(2)Write a program in 8086 assembly language to find the user specified number in a list of 15 numbers which is stored in a specific location.

(3)Write down the method of converting a binary number into its Gray Code equivalent. Also, give an example

Question 3.

(a) Using NAND gate generate the AND and NOR functions.

(b) What is meant by "addressing mode" ? Explain why the different addressing modes are required. Explain any two addressing modes that need no address field at all. Giving suitable example for each.

(c) Explain the principles of vector processing. Also, explain various types of vector instructions and their execution.

Question 4.

(a) Explain the DMA controller with block diagram. What is meant by a block transfer ?

(b) What are the various phases of an instruction cycle ? Give the micro operation of :fetch and decode phases

(c) Compare Static RAM with Dynamic RAM.

Question 5.

(a) Simplify the following expression using Karnaugh's map in product of sum form :
F (W,X , Y, Z',)=I (0, 1, 2, 3, 4, 6, 7, g, g,11, 15) Also, draw the logic circuit for the simplified expression.

(b) Subtract 1010100 - 1000011 using 2's complernent.

(c) Convert 2222in hexadecimanl umber.

(d) Write an 8086 assembly language program to convert a 4-digit octal number to its decimal equivalent

(e) List the registers that are used by the ALU to ,perform various tasks. Also, explain how these registers are used.

(f) What is a cache memory ? Explain about multiple levels of cache.

(g) Differentiate between RISC and CISC architecture