B. Tech.

(SEM. IV) EXAMINATION, 2008-09
COMPUTER ORGANIZATION

Time : 3 Hours]   *[Total Marks : 100*

Note: (1) Attempt **ALL** questions.

(2) **All** questions carry **equal** marks.

(3) Be precise in your answer.

(4) **No Second Answer** book will be provided.

1   Attempt any **four** parts of the following: **5×4=20**

(a) Represent the following conditional control statement by two register transfer statements with control function :

if (P=1) then (R1 ← R2) else if (Q=1) then (R1 ← R3)

(b) Register A holds the 8-bit binary 11011001. Determine the B operand and the logic micro-operation to be performed in order to change the value in A to :

(i)   01101101

(ii) 11111101

(c)　Design a 4-bit adder-subtractor with complete block diagram.

(d)　What do you mean by high speed adder? Discuss design of high speed adders.

(e)　Write short note on the following :

　　(i)　Common Bus system

　　(ii)　Bus Arbitration.

(f)　Give IEEE standard for floating point numbers.

2　Attempt any **two** parts of the following:　　10×2=20

(a)　What do you understand by hard wired control unit? Give various methods to design hardwired control unit. Describe one of the design methods for hardwired control unit with suitable diagrams.

(b)　Write short note on the following :

　　(i)　Multiple-bus organization

　　(ii)　Micro-programmed control unit.

(c)　(i)　What do you mean by wide-branch addressing? Explain with example.

　　(ii)　Differentiate between a microprocessor and a microprogram? Is it possible to design a microprocessor without a microprogram? - Explain.

3　Attempt any **two** parts of the following:　　10×2=20

(a)　(i)　A computer has 32-bit instructions and 12-bit addresses. If there are 250 two-address instructions, how many one-address instructions can be formulated ?

(ii) Write a program to evaluate the arithmetic statement using a general register computer with three address instructions :

X = A - B + C * (D * E - F)

(b) What is the significance of addressing modes? Describe various addressing modes with suitable examples.

(c) Write short note on the following :

(i) RISC and CISC

(ii) Stack Organization.

4   Attempt any **two** parts of the following :   10×2=20

(a) (i) Describe DMA with suitable block diagram. Why does DMA have priority over the CPU when both request a memory transfer? - Explain.

(ii) What programming steps are required to check when a source interrupts the computer while it is still serviced by a previous interrupt request from the same source? - Explain.

(b) Write short note on the following together with their importance :

(i) Input-output processor

(ii) Serial Communication.

(c) Why Input-Output interface is required? Describe various methods for I/O interface together with their merits and demerits.

5 Attempt any **two** parts of the following : **10×2=20**

(a) A ROM chip of 1024 × 8 bits has four select inputs and operates from a 5-volt power supply. How many pins are needed for the IC package? Draw a block diagram and label all inputs and output terminals in the ROM.

(b) Define the terms address space and memory space. An address space is specified by 24 bits and the corresponding memory space by 16 bits. Find the following :

    (i) How many words are there in the address space?

    (ii) How many words are there in the memory space?

    (iii) If a page consists of 2K words, how many pages and blocks are there in the system?

(c) Write short notes on any **two** of the following :

    (i) Auxiliary memory

    (ii) Memory Hierarchy

    (iii) Virtual Memory

    (iv) Cache Memory.