401(N)

B. E. (Fourth Semester) EXAMINATION, June, 2010

(New Scheme)

(Common for CS, EC & IT Engg. Branch)

COMPUTER SYSTEM ORGANIZATION

Time : Three Hours

Maximum Marks : 100

Minimum Pass Marks : 35

Note : Attempt *one* question from each Unit. All questions carry equal marks.

Unit–I

1. (a) Draw and explain the functional block diagram of 8085 microprocessor. Also draw its flag structure. 10

   (b) Write down the instruction formats of a basic computer. Explain the fetch, decode and execution cycle of any *one*. 10

Or

2. Write short notes on the following : 20

   (a) Computer registers

   (b) Stored program organization

   (c) Microoperations

   (d) Instruction cycle

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Unit–II

3. (a) Compare hardwired and microprogrammed control units giving their relative merits and demerits. 10

   (b) Draw the format of a microinstruction and explain how a microprogram sequencer works. 10

Or

4. (a) Explain the algorithm for division of signed magnitude data. What is divide overflow ? 10

   (b) Draw the block diagram of a BCD adder. Explain how decimal subtraction can be performed. 10

Unit–III

5. (a) Explain how I/O interfaces supervise and synchronize the processor bus and the pheripheral devices. 10

   (b) What are the different methods of DMA transfer ? Explain the actual process of direct memory access. 10

Or

6. (a) Enlist the data transfer instructions of 8085 microprocessor. Write an assembly language program to add two 8 bit numbers 46 H and 52 H and to store the result at 4008 H . 10

   (b) What are the advantages of handshaking during asynchronous data transfer ? Which signed are used for handshaking ? 10

Unit–IV

7. Explain the following terms : 20

   (a) Destructive and non-destructive memory readout

   (b) Read and virtual memory

   (c) Associative and set associative memory

   (d) Memory management unit

Or

9. (a) Explain cache memory organization. Which mapping techniques are used in cache memory ? 10

(b) A virtual memory system has an address space of 8 k words, a memory space of 4 k words and page and block sizes of 1 k words. The following page reference changes occur during a given time interval. (only page changes are listed. If the same page is referenced again, it is not listed twice)

4 2 0 1 2 6 1 4 0 1 0 2 3 5 7

Determine the 4 pages that are resident in main memory after each reference change if the replacement algorithm used is : 10

(i) FIFO

(ii) LRU

Unit – V

10. (a) Draw a four segment instruction pipeline. Also draw the timing diagram. 10

(b) Explain the following terms in relation to pipelining : 10

(i) Throughput

(ii) Space time diagram

(iii) Speedup

(iv) Hardware interlocks

(v) Operand forwarding

Or

10. (a) Explain how branch instructions are handled in pipelining ? 10

(b) Write a short note on supercomputers. 10