EX\CP31D\9\06

B. C. S. E. PART-I EXAMINATION 2006

1st Semester

COMPUTER ORGANISATION

Time : Three hours Full Marks : 100

Answer any ***five*** questions.

1. a) What is the minimum set of registers required in the CPU of a small computer ? Explain their operations. 4+4

   b) With the help of a logical block diagram explain how addition, subtraction, AND, OR, XOR and X NOR operation can be performed. 12

2. a) Explain the various hard wired methods of control signal generations. 12

   b) Show how can the control signals for Fetch cycle be generated by using clocked delay elements ? 8

3. a) What are the various methods of micro-programming ? What are their relative merits and demerits ? 12

   b) A processor has micro instruction format having four control fields. The number of control signals to be generated by each control fields are 4, 3, 11 and 8 respectively.

Compare the length of control bits of the micro-instruction register for various modes of micro-programming. 8

4. a) In a virtual memory system estimate the cost/bit, access time and access efficiency of the system. 8

   b) A memory unit has a capacity for storing the memory is empty. The page request generated by a program is : 4 2 0 1 2 6 1 4 3 1 0 2 3 5 7.

   Compare the performances of FIFO, LRV and LLV replacement policies. 12

5. a) What are the different address mapping techniques used in a cache ? What are their relative merits and demerits ? 12

   b) The main memory of a computer system has 9 capacity of storing 16 M words of 32 bit data. The cache can store upto 64KB of data. The page length of cache is 16 word and the set size is 4.

   Design the cache showing the sizes of the tag, index, block and word fields of cache address register. 8

6. a) What are the various types of interrupts ? Explain them. 3+6

   b) What do you understand by priorities among the interrupts. 3

c) Explain the operation of a priority encoder and show how the control of the machine is transferred to the appropriate ISR. 4+4

7. With the help of the block and state diagrams of a DMA controller explain the following operations related to DMA :

Initialisation, Initiation, Operation and Termination.

4+4+12

8. Write notes on any *four* of the following : 4×5

a) Instruction formats and their comparison;

b) Addressing modes ;

c) Merits and demerits of Nano-programming ;

d) Micro program sequencer ;

e) Advantages and disadvantages of Paged segments ;

f) CAM's

g) Program-controlled I/O's ;

h) Types of IOP;s.

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