May 2005

Bachelor of Computer Application (BCA) Examination

IV Semester

Digital Computers Organisation

Time 3 Hours] [Max. Marks 50

Note : All questions are compulsory.

1. (a) What are the essential elements of a CPU? Discuss the function of each element.

   (b) What do you understand by word length and speed of a computer? Explain with examples.

   OR

   (a) What are Microprocessors and Single Chip Microcomputers? Where are single chip microcomputers used? Give some examples of microcontrollers?

   (b) Distinguish between system software and application software with suitable examples.

2. (a) Discuss the operating principles of a raster scan CRT display and a vector scan CRT display.

   (b) What is a Scanner? What are different types of Scanners? Discuss their working principles.

   OR

   (a) Differentiate Impact printers and Nonimpact printers with example.

   (b) What is the function of a hard disk controller, floppy disk controller and dot matrix printer controllers?

3. (a) With the help of block diagrams explain the functioning of RAM and ROM chips?.

   (b) Answer the following questions :

   (i) How many 128 x 8 RAM chips are needed to provide a memory capacity of 2048 bytes?

   (ii) How many lines of the address bus must be used to access 2048 bytes of memory? How many of these lines will be common to all chips?

(iii) How many lines must be decoded for chip select? Specify the size of the decoders.

OR

(a) What is hit ratio? Illustrate various mapping procedures in the organization of cache memory.

(b) An address space in specified by 24-bits and the corresponding memory space by 16-bits :

(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 sysem?

4. (a) Distinguish between Distributed System, Network Systems and Parallel Systems.

(b) What is Spooling? What are the main advantages of multiprogramming?

OR

(a) What is a Computer Network? Discuss the main components of a Computer Network?

(b) A nonpipeline system takes 50 ns to process a task. The same task can be processed in a six-segment pipeline with a clock cycle of 10 ns. Determine the speedup ratio of the pipeline for 100 tasks. What is the maximum speedup that can be achieved?

5. (a) What is interrupt? Explain enabling, disabling and masking of interrupts. Discuss with suitable examples how to transfer data using interrupts.

(b) What is the difference between isolated I/O and memory- mapped I/O? What are the advantages and disadvantages of each?

OR

(a) What is DMA? Explain the working of DMA controller.

(b) Discuss how memory chips and I/O devices are interfaced to a microprocessor?

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