CCE1012_Tutorial Memory

1. Write short notes on the following:

      (a)   optical disk organisation
      (b)   refresh circuit in a dynamic RAM
      (c)   scheduling software in the operating system
      (d)   error correction in a memory IC

2.   (a)   Two of the most common types of magnetic media are tape and disc. Mention briefly the way each is organised, and discuss the advantages and disadvantages of each type

      (b)   How is error recovery achieved on a large magnetic disc system?

      (c)   Three common peripherals are
                   (i)   a laser printer;
                   (ii)   a hard disc
                   (iii)   a network interface card.

      Order the three in order of speed starting from the slowest. Discuss methods of how the CPU should interface to these peripherals.

3.   A magnetic disk unit has 24 recording surfaces. It has a total of 14000 cylinders. There is an average of 400 sectors per track. Each sector contains 512 bytes of data.
(a) What is the maximum number of bytes that can be stored on this unit.
        (Hint: Do not forget to divide by 1024's)
           65,625 Mbytes
(b) What is the data transfer rate in bytes per second at a rotational speed of 7200 rpm   *24,000kbytes per sec*
(c)   Using a 32-bit word, suggest a suitable scheme for specifying the disk address, assuming there are 512 bytes per sector.
Hint: The bytes within sectors do not need address. Extra bits left at top (surfaces)
        Surfaces(4+5); Tracks 14, sectors 9

4.   A processor has ten address lines. The memories available have only eight address lines.
(i) How many bits (cells) are there on the RAM?   (256)
      (ii) Four RAM IC's can be used to make full use of the ten address lines. Show the organisation of the RAM's if:
      (a) the top two address lines are used to distinguish the system
This has $A_0...A_7$ on each RAM; A_8 and A_9 are input to a 2 to 4 decoder
      (b) the bottom two address lines are used to distinguish the system.

Similar to (a) with $A_2...A_9$ to RAM and A_0 and A_1 to decoder

Show clearly the organisation, including any enables, decoding etc. necessary.
Comment on the advantages and disadvantages of the two methods