**CO –UNIT 5 Assignment- The Memory System**

1. Explain Classification of Computer memory System  
2. Explain the importance of memory hierarchy  
3. Define the following  
       Sequential access, Direct Access, Random Access, Associative Access  
        Access time, memory Cycle Time, Transfer rate  
4. Explain how the Bit cells are organized in a Memory chip  
5. Explain the organization of a 1k X 1 Memory with a neat sketch  
6. Explain SRAM and DRAM  
7 Explain Different type of ROM  
8 Explain chip interconnection  
9 Explain the following  
      a) Asynchronous DRAM               b)Synchronous DRAM  
                                                  (or)  
      Compare and Contrast Asynchronous DRAM and Synchronous DRAM  
10 a) A computer uses RAM chips of 1024 X 1 capacity.  
             i) How many chips are needed and how should their address lines be connected   
                  to provide a memory capacity of 1024 bytes  
            ii) How many chips are needed to provide a memory capacity of 16K bytes  
     b) An address space is specified by 24bits 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  
11. a) How many 128 \* 8 RAM chips are needed to provide memory capacity of 2048 bytes?  
       b) How many lines must be decoded for chip select? Specify the size of the decoders  
12 Explain in detail the different types of mapping techniques used in the usage of cache memory.  
13 Explain two way set associative mapping and four way set associative mapping    techniques with an example for each  
14 a) A two way set associative cache memory uses blocks of 4 words. The cache can accommodate a total of 2048 words from main memory. The main memory size is 124K X 32  
    i) Formulate the information required to construct cache memory  
    ii) What is the size of cache memory  
    b) The access time of cache memory is 100ns and that of main memory is 1000ns It is estimated that 80% of memory requests are for read and remaining 20% for write. The hit ratio for read access only is 0.9 .  A write through procedure is used   
             i) What is the average access time of the system considering only read cycles?  
             ii) What is the average access time of the system considering both read and write cycles?  
15. What is Virtual Memory? What are the issues behind the usage of this technique?

16. What are the advantages and disadvantages of using the technique of Paged Segmentation

17 ”In paged segmentation, the reference time increases and fragmentation decreases”, Justify your answer

18 Explain the following

1. Magnetic disk
2. Optical disk
3. Magnetic tape

19 (a) What is Redundant Array of Inexpensive Discs? What are the advantages of using this kind of systems?

(b) Explain different levels of RAID

20 A Virtual Memory System has an address space of 8K words and a Memory space of 4K words and page and block sizes of 1K words. Determine the number of page faults for the following page replacement algorithms: 1) FIFO 2) LRU if the reference string is as follows: 4,2,0,1,2,6,1,4,0,1,0,2,3,5,7.