1. Consider a logical address space of 64 pages of 1024 words each, mapped onto a physical memory of 256 frames.
a) How many bits are there in the logical address?
b) How many bits are there in the physical address?

2. Consider a byte-addressable (addresses are memory byte addresses) memory-management system using ***paging*** and a logical address consists of 16-bit page number and 10-bit offset.
a) What is the frame size in this system?
b) What is the maximum number of entries in a page table?
c) What is the maximum size of the logical address space?
d) How many frames are needed to store the largest page table if the size of a page table entry is 4 bytes?

3. Consider a segmentation system with the following segment table.

Segment number	Base	Limit
0	660	248
1	1752	422
2	222	198
3	996	604

For each of the following logical addresses, determine the physical address or indicate if the address is invalid (out of bound).
a) 0, 198
b) 2, 156
c) 1, 530

4. Most systems allow programs to allocate more memory to its address space during execution. Is ***relocation*** required to support dynamic memory allocation in segmentation and paging?

Self-test

1. The concept of Memory Management satisfies certain system requirements including:
A) relocation
B) protection
C) physical organization
D) all of the above

2. _____ is transparent to the programmer and eliminates external fragmentation providing efficient use of main memory.
A. Hashing
B. Paging
C. Segmentation
D. Thrashing

3. In a system employing a paging scheme for memory management, wasted space is due to _____.
A. external fragmentation
B. internal fragmentation
C. pages and frames of different specified sizes
D. none of the above

4. The page table for each process maintains _____ .
A. the physical memory location of the process
B. the frame number for each page of the process
C. the page number for each frame of the process
D. the logical memory location of the process

5. In a system employing a segmentation scheme for memory management, a process is divided into _____ .
A. one segment per thread
B. a number of threads
C. a number of segments which need not be of equal size
D. a number of segments which must be of equal size

6. In a system employing a segmentation scheme for memory management wasted space is due to _____ .
A. external fragmentation
B. frames of different sizes
C. internal fragmentation
D. segments of different sizes