Homework 7

1. (10 points) Given six memory partitions of 170 MB, 100 MB, 40 MB, 205 MB, 300 MB, and 185 MB (in order), how would the first-fit, best-fit, and worst-fit algorithms place processes of size 200 MB, 15 MB, 185 MB, 75 MB, 175 MB, and 90 MB (in order)? Indicate which – if any – requests cannot be satisfied.

2. Exercise 9.14 (10 points) Most systems allow a program to allocate more memory to its address space during execution. Allocation of data in the heap segments of programs is an example of such allocated memory. What is required to support dynamic memory allocation in the following schemes?

a. Contiguous memory allocation
b. Paging

3. Exercise 9.15 (10 points) Compare the contiguous memory allocation scheme to paging with respect to the following issues:

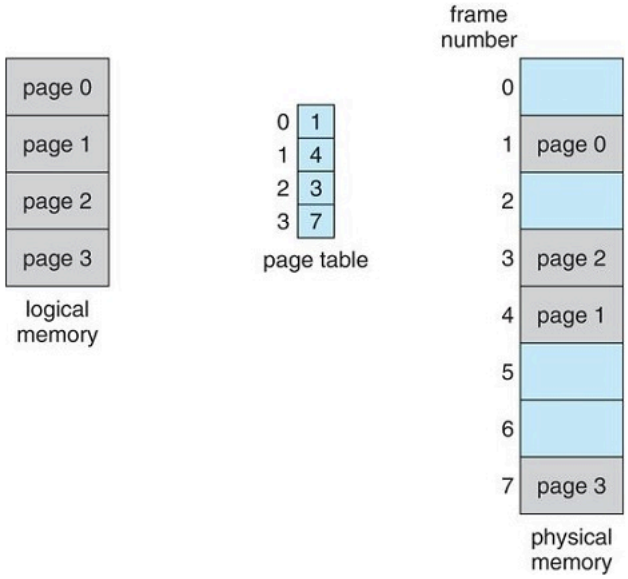
a. External fragmentation
b. Internal fragmentation

4. (10 points) Assuming a 1 KB page size, what are the page numbers and offsets for the following address references (provided as decimal numbers)?

a. 20,780
b. 197,018
c. 252,429
d. 1,647,822

5. (10 points) A process' logical address consists of 4 pages and the page size is 2KB. The page table of the process is given in below. Compute the physical address for each of the following logical addresses (provided as decimal numbers).

a. 1,018
b. 6,976



6. Exercise 9.23 (10 points) Consider a logical address space of 2,048 pages with a 4 KB page size, mapped onto a physical memory of 512 frames.

a. How many bits are required in the logical address?
b. How many bits are required in the physical address?