

REVIEW for EXAM - 02

1. Contents/Scope to be covered:

Lecture #15,16,17, and #19,20

2. How to prepare:

Read the textbook. Review my lecture slides posted on our website. Pay special attention to the summary page (usually page #3) in each lecture note which lists **important keywords and questions**.

Must know:

- Translate a logical address to a physical address with paging or with segmentation
- FF,BF,WF memory allocation methods
- FCFS,SSTF,SCAN,C-SCAN,C-LOOK disk scheduling methods

3. Format:

There will be 10 questions, some are essays, drawing diagrams, or multiple-choice (see below).

EXAMPLES OF QUESTIONS

Examples of multiple-choice questions:

- 1) The mapping of a logical address to a physical address is done with hardware by the _____.
a) memory management unit
b) memory address register
c) relocation register
d) dynamic loading register

ANSWER = a

Examples of essay questions:

- 2) Compare External and Internal Fragmentations.

ANSWER:

	External Fragmentation	Internal Fragmentation
Difference	The waste is across the blocks. When in total there is enough free memory for the next process, but the process can't be loaded (allocated in the memory), because all available blocks/holes are too small (none is big enough for the process)	The waste is inside blocks. A block may have some unused part of memory inside while the whole block is marked as used (not free)
Common	Both lead to a waste of (unused) memory	

3) What is working set model ? its purpose ?

ANSWER:

Working set model is when we preload SEVERAL next pages in the reference string/queue instead of just one next page. Its purpose is to reduce the number of page faults.

4) Consider the following *segment table*:

Segment #	Base	Length
0	321	600
1	5230	214
2	170	112
3	2086	580
4	952	396

What is the physical address for the following Logical Addresses. Explain how you find it.

a) LA = [3 , 500]

b) LA = [1 , 321]

ANSWER:

a) Logical Address LA = [3 , 500] means the segment number = 3 and the Offset = 500.

Use the fact that the segment = 3 in LA, look up at the Segment Table,

we'll have **Base = 2086**, and the **Offset = 500**

As the **length = 580**, which is more than the Offset. Therefore, it's OK.

The physical address = BASE, Offset or = **2086, 500**

b) Logical Address LA = [1 , 321] means the segment number = 1 and the Offset = 321.

Use the fact that the segment = 1 in LA, look up at the Segment Table,

we'll have **Base = 5230**, the **Offset = 312**

BUT the **length = 214**, which is less than the Offset. Therefore, it's an **INVALID ADDRESS**

5) Consider the following *page table*:

Page #	Frame #
0	7311
1	323
2	814
3	257
4	9201

Each page has 1000 bytes. Each address covers one byte. What is the physical address for the following Logical Address LA = [2 , 257] ? Explain how you find it.

ANSWER:

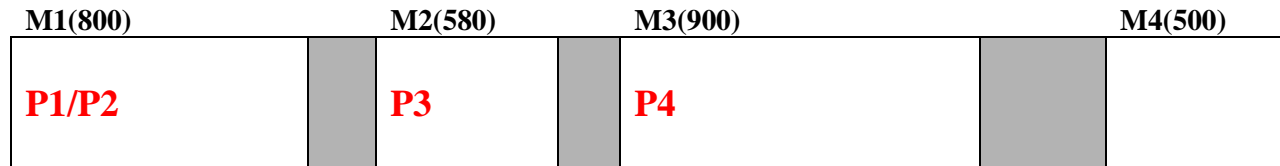
Logical Address LA = [2 , 257] means page number = 2 and the Offset = 257.

Use page = 2 in LA, look up at the Page Table, we'll have **Frame = 814**, the **Offset = 257**

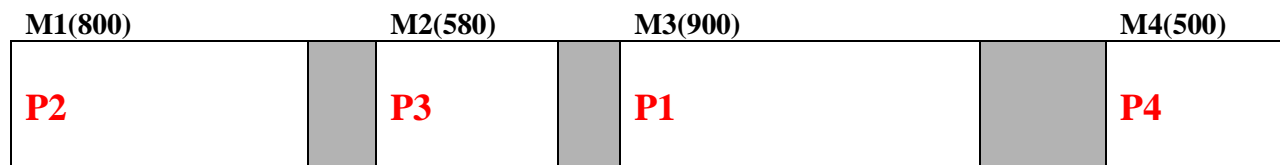
Therefore, the physical address (PA) is [Frame #, Offset] or [**814, 257**]

6) Given 4 memory partitions: 800K, 580K, 900K, and 500K (in order) as shown in the following diagrams. Show in each diagram how would processes P1(470K), P2(330K), P3(440K), and P4(420K), arrived in that order, can be placed in the memory and how much memory left in each partition.

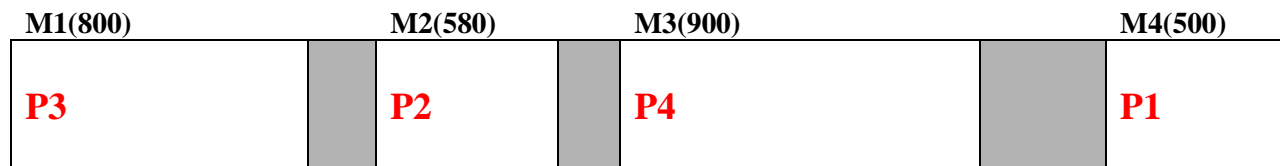
a) by **FIRST-FIT memory allocation Method:**



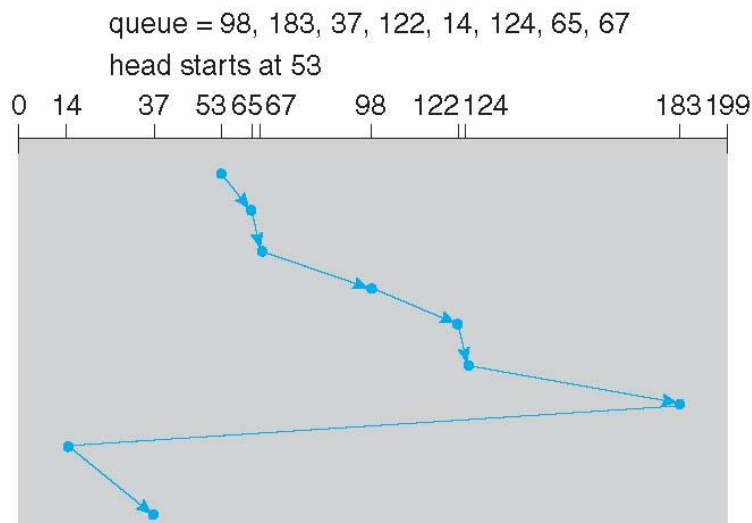
b) by **WORST-FIT memory allocation Method:**



c) by **BEST-FIT memory allocation Method:**



7) Given the following queue of disk references. The read/write head is currently at 53. Draw the map/diagram to show the disk scheduling using C-LOOK method.



Example of draw-diagrams questions:

8) Draw a diagram to show an example of **shared pages**
(slides# 16 page 27)

