UECS2103/2403/2423 Operating Systems

Tutorial 7

1. Translate the following 16-bit virtual addresses (the first 8 bits yield to page number, the last 8 bits yield to offset) to their corresponding real addresses (in decimal) based on the information given in figure below.

   i. 1001110001110101
   ii. 0010001100011011
   iii. 0010010011010001

Page #	Frame #
24	259
102	125
156	992

TLB

	Frame #
34	356
35	357
36	-

Page table

2. A process is divided into six pages on disk and is assigned a fixed allocation of three page frames in the main memory. The following page trace occurs:

   1 2 5 1 3 2 4 5 2 4 3 5 6 2 4 1 6

   Assume that the frames are initially empty. Show the successive pages residing in the three frames using:

   a. LRU replacement policy.
   b. FIFO replacement policy.
   c. Clock replacement policy.

3. Consider the page table for a process as shown below. All numbers are decimal, all addresses are memory byte addresses and the page size is 1024 bytes.

Virtual page number (VPN)	Page frame number (PFN)
0	4
1	7
2	-
3	2
4	-
5	0

   Determine the physical address, if any, for the following virtual addresses.
   a) 1052

   b) 2221

   c) 5499

4. Briefly describe the translation of virtual address of a segment to its corresponding real address.

5. Briefly explain the combination of segmentation and paging schemes in memory management.