**PROBLEM SESSION 4: Virtual Memory**

1. A computer has four page frames. The time loaded, time of last access, and reference bit for each page are as shown below (the times are in clock ticks):

PAGE LOADED LAST ACCESS R

0 126 279 0

1 230 260 0

2 120 272 1

3 160 280 1

1. Which page will FIFO replace? = Page 2
2. Which page will Second Chance replace? = Page 0
3. Which page will LRU replace? = Page 1

2. For each of the page replacement policies listed below, calculate the total number of page faults encountered when referencing the following pages:

0 1 6 0 3 4 0 1 0 3 4 6 3 4

Assume the availability of 4 page frames, where initially they are all empty.

a) FIFO = 12 page fault

b) CLOCK = 7 page fault

c) LRU = 7 page fault