BRAC University, Dhaka Department of Computer Science and Engineering
CSE321: Operating Systems
Quiz - 4

Marks: 15 **Time: 30 Min**

Name:	ID:	Section:

1. Determine if the following sentences are true or false. For any false sentence, write its correct form. 3*1 = 3

   i. Paging can help avoiding external fragmentations. (T)

   ii. In the best-fit, the first hole that is big enough is allocated. (F)
   The hole with the smallest size is allocated.

   iii. MMU translates a physical address to a logical address. (F)
   MMU translate a logical address to a physical address.

2. What is an external fragmentation? How can you handle external fragmentations in your system? 2

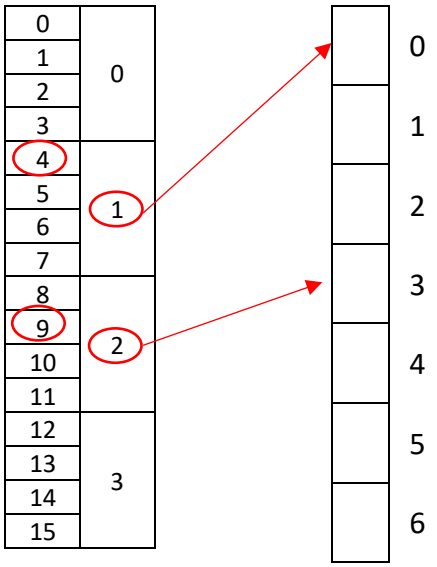
   External fragmentation occurs due to situation where there are enough total memory spaces to satisfy a request, but these spaces are not contiguous, hence, cannot be allocated.

   Compaction is the technique to handle external fragmentations.

3. Suppose there is a process P with 16 bytes and a page size of 4 bytes. The main memory size is 28 bytes. The page table for P is: 2 + 2

   Find the physical addresses of these logical addresses: 0100 and 1001

p	f
0	4
1	0
2	3
3	5



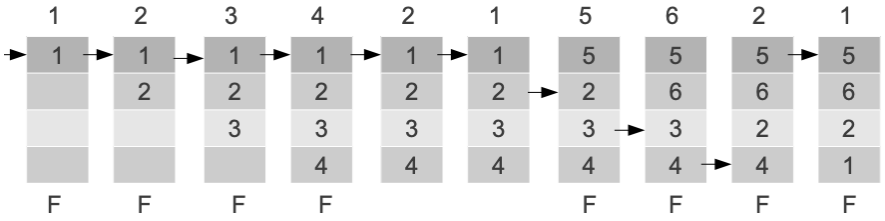
$(0100)_2 = (4)_{10}$, 0 * 4 + 0 = $(0)_{10} = (0)_2$

$(1001)_2 = (9)_{10}$, 3*4 +1 = $(13)_{10} = (1101)_2$

4. Assume the following page references as per the time. Apply the FIFO and Optimal page replacement algorithms. Determine which one is better with respect to number of page faults. Consider there are 4 frames in your memory. 2 + 2 + 2

Time	1	2	3	4	5	6	7	8	9	10
Page	P1	P2	P3	P4	P2	P1	P5	P6	P2	P1

FIFO:



OPT:

1	2	3	4	5	6	7	8	9	10
P1	P2	P3	P4	P2	P1	P5	P6	P2	P1
P1	P1	P1	P1	P1	P1	P1	P1	P1	P1
	P2	P2	P2	P2	P2	P2	P2	P2	P2
		P3	P3	P3	P3	P5 (P3)	P5 (P6)	P5 (P6)	P5 (P6)
			P4	P4	P4	P4 (P5)	P6 (P5)	P6 (P5)	P6 (P5)

An alternative solution is possible when choosing between P3/P4 at time 7. This solution is given in the brackets.

Since OPT has 6 faults and FIFO produces 8 faults, OPT is better.