EAST WEST UNIVERSITY BANGLADESH
Department of Computer Science & Engineering

CSE325: Operating System

Final-Term Examination **Fall 2015**

Total Marks: 30 Instructor: Dr. Md. Shamim Akhter Time: 90 minutes

PART-I : Memory Management (15)

1.

a) For each of the following decimal virtual addresses, compute the virtual page number and offset for a 1K (1024 bytes) page size. Thereafter, convert the virtual address to physical address using the given page table information. (2)

a) 4404 b) 900

Virtual page	Valid	Physical page
0	No	
1	No	
2	Yes	1
3	No	
4	Yes	3
5	No	
6	Yes	0
7	Yes	2

b) Consider the following **segment table** for **process X**:

Segment #	Base	Length
0	3000	450
1	2000	350
2	2650	350
3	1050	350

What are the physical addresses for the following logical addresses (Segment#, Offset)? (3)

a) 0,240 b) 2,450 c) 1,000

c) If a system has **32-bit address space**, **four (4) kilobytes** (2^{12}) page size, and each page table entry consumes **four (4) bytes**, how much memory would be required to keep the entire page table in memory? (2)

2.

a) FIFO is known to exhibit Belady's anomaly. Could LRU exhibit Belady's anomaly? Why or why not? (2)

b) If FIFO page replacement is used with four (4) frames (initially empty), how many page faults will occur with the following page references? (3)

0 1 7 2 3 2 7 1 0 3

c) Calculate the page fault for the above problem with LRU page replacement. (3)

PART-II : Dead Lock, File and Storage Management (15)

3. Consider the following snapshot of a system:

	Allocation				Max				Available			
	A	**B**	**C**	**D**	**A**	**B**	**C**	**D**	**A**	**B**	**C**	**D**
P_0	0	0	1	2	0	0	1	2	2	1	0	0
P_1	2	0	0	0	2	7	5	0				
P_2	0	0	3	4	6	6	5	6				
P_3	2	3	5	2	4	3	5	6				
P_4	0	3	3	2	0	6	5	2				

Answer the following questions using the **banker's algorithm**:

a) What is the content of **Need matrix**? (1)

b) Is the system in a **safe state**? (4)

4.

a) What file access pattern is particularly suited to **chained file allocation** on disk? (1)

b) What file allocation strategy is most appropriate for **random access files**? (1)

c) Consider a system that supports the strategies of **continuous, linked and indexed** allocation. What criteria should be used in deciding which strategy is best utilized for a particular file? (3)

5. Disk requests come into the disk driver for cylinders **10, 22, 20, 2, 40, 6, 38** (in that order). A seek takes **five(5) msec** per cylinder moves. How much seek time is needed for:

a) First-come, first served. (1)

b) Shortest seek time first or Closest cylinder next. (2)

c) Look or Elevator algorithm (initially moving upward). (2)

In all cases, **the disk head is initially at cylinder 20**.