



EAST WEST UNIVERSITY BANGLADESH
Department of Computer Science & Engineering

CSE325: Operating System (1)

Final Exam

Summer 2016

Total Marks: 30

Instructor: Dr. Md. Shamim Akhter

Time: 90 minutes

1. Consider a system with four (4) processes (P1 through P4) and three (3) resource types A, B, C. Suppose the following snapshot is showing current process status.

Process ID	Allocated			Max		
	A	B	C	A	B	C
P1	1	3	2	9	4	3
P2	3	2	0	4	9	6
P3	4	1	1	5	1	5
P4	1	4	2	6	7	3

- a) Draw the Needs table for the system. (1)
 - b) Suppose the numbers of free resources are: **A = 1, B = 2, C = 4**. Evaluate the process sequence that will prove that this system is in a safe state or identify that it is not in a safe state. (4)
 - c) Suppose that process P2 makes a request for **A=0, B = 1, C = 2**. Would this request be granted or not? (2)
 - d) Assume a system has three processes (1, 2, and 3) and three resources (A, B, and C). Draw the Resource Allocation Graph (RAG) to show that all three processes are in deadlock. (3)
- 2.
- a) In a paging scheme, if there are **64 pages** and the maximum page size is 1024 bytes. How many bits are required to represent a logical address? (2)
 - b) Why does paging scheme need two memory accesses for each memory reference (e.g. **load \$t0, [m]**)? (2)
 - c) Suppose the page table for the process currently executing on the processor looks like the following. The **page size is 1,024 bytes**.

Page #	Frame#
0	1
1	2
2	-
3	3

What physical address, would each of the following virtual addresses correspond to? (2)
1500, 2221.

- d) Suppose that a newly-created process has **four (4) page frames** allocated to it, and then generates the page references as below (**bolded A, B, C, D & E represent used and modified page**):

A B C D A B E C A B C D A

How many page faults would occur with the following page replacement algorithms:

- i. **Second-chance cyclic.** (2)
- ii. **Least recently used (LRU).** (2)

3.

- a) A disk request queue has requests for blocks on the following cylinders (ordered by time of arrival): **55, 58, 39, 18, 90, 160, 150, 38, 184**

The disk has **200 cylinders** numbered 0 through 199. The disk head is currently at cylinder 100 and is moving towards the lower track.

Calculate the total seek distance for each of the following algorithms:

SSTF and C-LOOK. (6)

- b) Assuming a **seek time of 5 msec**, a **rotational delay of 4 msec**, a **transfer rate of 8MB/sec**, no controller overhead, queue is idle and an average file size of 8KB, how long does it take to read a file into main memory then write it back to the disk at a new location? (4)