EAST WEST UNIVERSITY BANGLADESH
Department of Computer Science & Engineering

CSE325: Operating System

Term-II Examination **Summer 2015**

Total Marks: 40 Instructor: Dr. Md. Shamim Akhter Time: 90 minutes

1. 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	1	5	2	0
P_1	1	0	0	0	1	7	5	0				
P_2	1	3	5	4	2	3	5	6				
P_3	0	6	3	2	0	6	5	2				
P_4	0	0	1	4	0	6	5	6				

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

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

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

c) If a request from process P_1 arrives for (**0, 4, 2, 0**), can the request be granted immediately?

2.

a) What is the difference between deadlock and starvation?

b) Is it possible to have a deadlock involving only one process? Explain your answer concerning the four required deadlock conditions.

c) Proof - "If all processes always request resources in a fixed order, there can be no hold-and-wait cycle".

3.

a) Can any of the three scheduling schemes (**FCFS, SRTF, or RR**) result in starvation? If so, how might you fix this?

b) Five processes **A, B, C, D** and **E** arrived in this order at the same time with the following CPU burst and priority values. A smaller value means a higher priority.

	CPU Burst	**Priority**
A	3	3
B	7	1
C	5	5
D	2	4
E	6	2

Fill the entries of the following table with **waiting time** and **average waiting time** for each indicated scheduling policy and each process. Ignore context switching overhead.

Scheduling Policy	*Waiting Time*					*Average Waiting Time*
	A	B	C	D	E	
First-Come-First-Serve						
Shortest-Job First						
Priority						
RR (time quantum=5)						

4. For the following set of processes:

P_1:	**P_2:**	**P_3:**
Wait(mutex1)	Wait(mutex1)	Wait(mutex2)
Wait(mutex2)	Wait(mutex2)	Wait(mutex1)
Signal(mutex1)	Signal(mutex1)	Signal(mutex2)
Signal(mutex1)	Signal(mutex2)	Signal(mutex2)

Initially mutex1 and mutex2 are set as 1

a) Describe a situation when there is a deadlock. List what processes are in this deadlock.

b) If only processes P_1 and P_2 existed, would there be a deadlock? Why or why not?