BRAC University, Dhaka Department of Computer Science and Engineering
CSE321: Operating Systems
Quiz - 3

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. 5*1 = 5

   i. Deadlock is bound to happen in an unsafe state. (F)
   There is a possibility of deadline in an unsafe state.

   ii. Having cycle in resource allocation graph is a necessary and sufficient condition for a deadlock. (F)
   It is a necessary condition, but no sufficient.

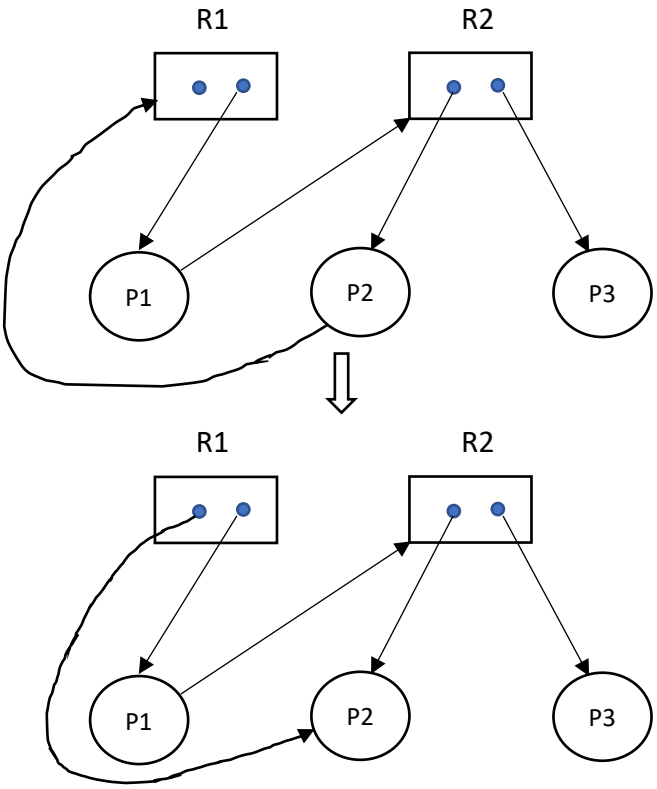
   iii. Peterson's solution is hardware based solution. (F)
   It is a s/w based solution

   iv. Counting semaphore can only have two values: 0 & 1. (F)
   It can have more than two values.

   v. Non-preemptive kernel is free from race condition. (T)

2. Consider, P={P1, P2, P3} and R={R1, R2} with both R1 and R2 have 2 instances. Draw a Resource Allocation Graph with the following conditions. Determine if there is a deadlock in the graph. 2+1

   i. P1 is holding R1 and requesting R2.
   ii. P2 is holding R2 and requesting R1.
   iii. P3 is holding R2.



There is a cycle, but no deadlock.

3. What is a critical section? What issue can be solved using critical section. 2

Critical section represents a segment of code of each process, which may change common variables, update a table, write a file and so on.

CS can solve the synchronisation problem of processes and ultimately solve the race condition.

4. Assume, there are three processes: P0, P1, P2. Also, there are three resources with the following instances: R0 (4), R1 (2), R2 (3). Now, consider following Allocation and Maximum Matrix:

P0	1	1	1
P1	1	0	0
P2	1	0	1

Allocation Matrix

P0	3	1	2
P1	2	1	1
P2	2	0	2

Maximum Matrix

i. Determine the need and the available matrices. 1 + 1

Available Resources:

1	1	1

Need Matrix:

2	0	1
1	1	1
1	0	1

ii. Determine the safe sequence (if any). 3

Safe Sequence is: P1 -> P2 -> P0