

CSPB 3753 - Fall 2024 - Knox - Operating Systems

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Started on Monday, 4 November 2024, 8:06 PM

State Finished

Completed on Monday, 4 November 2024, 8:23 PM

Time taken 17 mins 12 secs

Grade 9 out of 10 (90%)

Question **1**

Correct

Mark 1 out of 1

Match the following terms

Deadlock
Detection

Deadlocks are allowed to occur and system will examine itself periodically to detect detection and correct it.



Deadlock
Avoidance

For every resource request, the system determines if it would be in an unsafe state by granting that request. And thereby, will not grant it.



Deadlock
prevention

Preventing one of the four necessary and sufficient conditions from occurring



Your answer is correct.

The correct answer is: Deadlock Detection → Deadlocks are allowed to occur and system will examine itself periodically to detect detection and correct it., Deadlock Avoidance → For every resource request, the system determines if it would be in an unsafe state by granting that request. And thereby, will not grant it., Deadlock prevention → Preventing one of the four necessary and sufficient conditions from occurring

Question 2

Correct

Mark 1 out of 1

Select all the necessary and sufficient conditions to cause deadlock

Select one or more:

- ☒ a. Circular wait, A process must be waiting for a resource which is being held by another process, which in turn is waiting for the first process to release a resource ✓
- ☐ b. Reentrant - (All tasks must be reentrant to avoid deadlock)
- ☒ c. Mutual Exclusion, (a resource is held in a non-shareable mode) ✓
- ☒ d. No Preemption, A resource can be released only voluntarily by the process holding it ✓
- ☐ e. Critical sections, (Critical sections don't disable interrupts)
- ☒ f. Hold-and-wait, (a process currently holding at least 1 resource is requesting additional resources held by other processes) ✓

Your answer is correct.

The correct answers are: Mutual Exclusion, (a resource is held in a non-shareable mode), Hold-and-wait, (a process currently holding at least 1 resource is requesting additional resources held by other processes), No Preemption, A resource can be released only voluntarily by the process holding it, Circular wait, A process must be waiting for a resource which is being held by another process, which in turn is waiting for the first process to release a resource

Question 3

Correct

Mark 1 out of 1

Deadlock may occur when (select all that apply)

Select one or more:

- ☒ a. A wait() is followed by a wait() instead of a signal() ✓
- ☐ b. The kernel and the user space violate race conditions
- ☒ c. A programmer reverses the order of wait() and signal() ✓
- ☐ d. A mutex is used to synchronize processes

Your answer is correct.

The correct answers are: A wait() is followed by a wait() instead of a signal(), A programmer reverses the order of wait() and signal()

Question 4

Correct

Mark 1 out of 1

Mark all valid deadlock prevention schemes:

Select one or more:

- ☒ a. Number the resources and never request a lower number resource than the allocated ones ✓
- ☒ b. Release all resources before requesting a new resource ✓
- ☐ c. Never request a resource after releasing any resource
- ☒ d. Request and allocate all the resources required to a process before the process execution ✓

Your answer is correct.

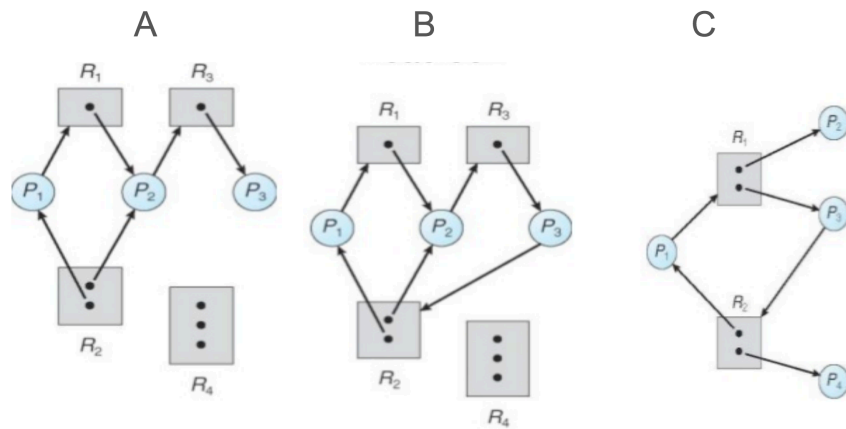
The correct answers are: Number the resources and never request a lower number resource than the allocated ones, Request and allocate all the resources required to a process before the process execution, Release all resources before requesting a new resource

Question 5

Incorrect

Mark 0 out of 1

Which of the following resource graphs shows deadlock?



Select one:

- ☐ a. A only
- ☐ b. B only
- ☐ c. C only
- ☐ d. A and B
- ☒ e. A and C
- ☐ f. B and C
- ☐ g. A, B, and C

✗

Your answer is incorrect.

The correct answer is: B only

Question 6

Correct

Mark 2 out of 2

Using the Bankers algorithm determine the current state of the system.

Resource Allocations

	Alloc			Max			Need		
	A	B	C	A	B	C	A	B	C
P1	0	2	3	7	6	4	7	4	1
P2	2	1	2	7	1	2	5	0	0
P3	0	1	0	3	3	2	3	2	2

Avail

A	B	C
5	2	1

Select one:

- ☐ a. the system is in a deadlock state
- ☐ b. Initially the system is in a safe state, but will deadlock
- ☐ c. the system is in an unsafe state
- ☒ d. the system is in a safe state
- ☐ e. depends on which process is running



Your answer is correct.

The correct answer is: the system is in a safe state

Question 7

Correct

Mark 3 out of 3

Using the Bankers algorithm determine the state of the system If P1 is allocated one more resource of type A.

Resource Allocations

	Alloc			Max			Need		
	A	B	C	A	B	C	A	B	C
P1	0	2	3	7	6	4	7	4	1
P2	2	1	2	7	1	2	5	0	0
P3	0	1	0	3	3	2	3	2	2

Avail

A B C
5 2 1

Select one:

- ☐ a. Initially the system is in a safe state, but will deadlock
- ☐ b. the system is in a deadlock state
- ☐ c. the system is in a safe state
- ☐ d. depends on which process is running
- ☒ e. the system is in an unsafe state



Your answer is correct.

The correct answer is: the system is in an unsafe state