1. What is a reusable resource?  
a) that can be used by one process at a time and is not depleted by that use  
b) that can be used by more than one process at a time  
c) that can be shared between various threads  
d) none of the mentioned

Answer: a

2. Which of the following condition is required for a deadlock to be possible?  
a) mutual exclusion  
b) a process may hold allocated resources while awaiting assignment of other resources  
c) no resource can be forcibly removed from a process holding it  
d) all of the mentioned

Answer: d

3. A system is in the safe state if \_\_\_\_\_\_\_\_\_\_\_\_  
a) the system can allocate resources to each process in some order and still avoid a deadlock  
b) there exist a safe sequence  
c) all of the mentioned  
d) none of the mentioned

Answer: a

4. The circular wait condition can be prevented by \_\_\_\_\_\_\_\_\_\_\_\_  
a) defining a linear ordering of resource types  
b) using thread  
c) using pipes  
d) all of the mentioned

Answer: a

5. Which one of the following is the deadlock avoidance algorithm?  
a) banker’s algorithm  
b) round-robin algorithm  
c) elevator algorithm  
d) karn’s algorithm

Answer: a

6. What is the drawback of banker’s algorithm?  
a) in advance processes rarely know how much resource they will need  
b) the number of processes changes as time progresses  
c) resource once available can disappear  
d) all of the mentioned

Answer: d

7. For an effective operating system, when to check for deadlock?  
a) every time a resource request is made  
b) at fixed time intervals  
c) every time a resource request is made at fixed time intervals  
d) none of the mentioned

Answer: c

8. A problem encountered in multitasking when a process is perpetually denied necessary resources is called \_\_\_\_\_\_\_\_\_\_\_\_  
a) deadlock  
b) starvation  
c) inversion  
d) aging

Answer: b

9. Which one of the following is a visual ( mathematical ) way to determine the deadlock occurrence?  
a) resource allocation graph  
b) starvation graph  
c) inversion graph  
d) none of the mentioned

Answer: a

10. To avoid deadlock \_\_\_\_\_\_\_\_\_\_\_\_  
a) there must be a fixed number of resources to allocate  
b) resource allocation must be done only once  
c) all deadlocked processes must be aborted  
d) inversion technique can be used

Answer: a

**Deadlock MCQ**

1. The circular wait condition can be prevented by \_\_\_\_\_\_\_\_\_\_\_\_

a) defining a linear ordering of resource types

b) using thread

c) using pipes

d) all of the mentioned

Answer: defining a linear ordering of resource types

2. A problem encountered in multitasking when a process is perpetually denied necessary resources is called \_\_\_\_\_\_\_\_\_\_\_\_

a) deadlock

b) starvation

c) inversion

d) aging

Answer: starvation

3. A system is in the safe state if \_\_\_\_\_\_\_\_\_\_\_\_

a) the system can allocate resources to each process in some order and still avoid a deadlock

b) there exist a safe sequence

c) all of the mentioned

d) none of the mentioned

Answer: the system can allocate resources to each process in some order and still avoid a deadlock

4. To avoid deadlock \_\_\_\_\_\_\_\_\_\_\_\_

a) there must be a fixed number of resources to allocate

b) resource allocation must be done only once

c) all deadlocked processes must be aborted

d) inversion technique can be used

Answer: there must be a fixed number of resources to allocate

5. Which one of the following is a visual ( mathematical ) way to determine the deadlock occurrence?

a) resource allocation graph

b) starvation graph

c) inversion graph

d) none of the mentioned

Answer: resource allocation graph

6. What is a reusable resource?

a) that can be used by one process at a time and is not depleted by that use

b) that can be used by more than one process at a time

c) that can be shared between various threads

d) none of the mentioned

Answer: that can be used by one process at a time and is not depleted by that use

7. Which one of the following is the deadlock avoidance algorithm?

a) banker’s algorithm

b) round-robin algorithm

c) elevator algorithm

d) karn’s algorithm

Answer: banker’s algorithm

8. Which of the following condition is required for a deadlock to be possible?

a) mutual exclusion

b) a process may hold allocated resources while awaiting assignment of other resources

c) no resource can be forcibly removed from a process holding it

d) all of the mentioned

Answer: all of the mentioned

9. For an effective operating system, when to check for deadlock?

a) every time a resource request is made

b) at fixed time intervals

c) every time a resource request is made at fixed time intervals

d) none of the mentioned

Answer: every time a resource request is made at fixed time intervals

10. What is the drawback of banker’s algorithm?

a) in advance processes rarely know how much resource they will need

b) the number of processes changes as time progresses

c) resource once available can disappear

d) all of the mentioned

Answer: all of the mentioned

**Deadlock Prevention MCQ**

1. For Mutual exclusion to prevail in the system \_\_\_\_\_\_\_\_\_\_\_\_

a) at least one resource must be held in a non sharable mode

b) the processor must be a uniprocessor rather than a multiprocessor

c) there must be at least one resource in a sharable mode

d) all of the mentioned

Answer: at least one resource must be held in a non sharable mode

2. For non sharable resources like a printer, mutual exclusion \_\_\_\_\_\_\_\_\_\_\_\_

a) must exist

b) must not exist

c) may exist

d) none of the mentioned

Answer: must exist

3. One way to ensure that the circular wait condition never holds is to \_\_\_\_\_\_\_\_\_\_\_\_

a) impose a total ordering of all resource types and to determine whether one precedes another in the ordering

b) to never let a process acquire resources that are held by other processes

c) to let a process wait for only one resource at a time

d) all of the mentioned

Answer: impose a total ordering of all resource types and to determine whether one precedes another in the ordering

4. Deadlock prevention is a set of methods \_\_\_\_\_\_\_\_\_\_\_\_

a) to ensure that at least one of the necessary conditions cannot hold

b) to ensure that all of the necessary conditions do not hold

c) to decide if the requested resources for a process have to be given or not

d) to recover from a deadlock

Answer: to ensure that at least one of the necessary conditions cannot hold

5. The request and release of resources are \_\_\_\_\_\_\_\_\_\_\_

a) command line statements

b) interrupts

c) system calls

d) special programs

Answer: system calls

6. The disadvantage of a process being allocated all its resources before beginning its execution is \_\_\_\_\_\_\_\_\_\_\_\_

a) Low CPU utilization

b) Low resource utilization

c) Very high resource utilization

d) None of the mentioned

Answer: Low resource utilization

7. The number of resources requested by a process \_\_\_\_\_\_\_\_\_\_\_\_

a) must always be less than the total number of resources available in the system

b) must always be equal to the total number of resources available in the system

c) must not exceed the total number of resources available in the system

d) must exceed the total number of resources available in the system

Answer: must not exceed the total number of resources available in the system

8. For a Hold and wait condition to prevail \_\_\_\_\_\_\_\_\_\_\_\_

a) A process must be not be holding a resource, but waiting for one to be freed, and then request to acquire it

b) A process must be holding at least one resource and waiting to acquire additional resources that are being held by other processes

c) A process must hold at least one resource and not be waiting to acquire additional resources

d) None of the mentioned

Answer: A process must be holding at least one resource and waiting to acquire additional

9. For sharable resources, mutual exclusion \_\_\_\_\_\_\_\_\_\_\_\_

a) is required

b) is not required

c) may be or may not be required

d) none of the mentioned

Answer: is not required

10. To ensure that the hold and wait condition never occurs in the system, it must be ensured that \_\_\_\_\_\_\_\_\_\_\_\_

a) whenever a resource is requested by a process, it is not holding any other resources

b) each process must request and be allocated all its resources before it begins its execution

c) a process can request resources only when it has none

d) all of the mentioned

Answer: all of the mentioned

11. To ensure no preemption, if a process is holding some resources and requests another resource that cannot be immediately allocated to it \_\_\_\_\_\_\_\_\_\_\_\_

a) then the process waits for the resources be allocated to it

b) the process keeps sending requests until the resource is allocated to it

c) the process resumes execution without the resource being allocated to it

d) then all resources currently being held are preempted

Answer: then all resources currently being held are preempted

12. What are Multithreaded programs?

a) lesser prone to deadlocks

b) more prone to deadlocks

c) not at all prone to deadlocks

d) none of the mentioned

Answer: more prone to deadlocks

13. For a deadlock to arise, which of the following conditions must hold simultaneously?

a) Mutual exclusion

b) No preemption

c) Hold and wait

d) All of the mentioned

Answer: All of the mentioned

**Deadlock Avoidance MCQ**

1. The content of the matrix Need is \_\_\_\_\_\_\_\_\_\_\_\_

a) Allocation – Available

b) Max – Available

c) Max – Allocation

d) Allocation – Max

Answer: Max – Allocation

2. A state is safe, if \_\_\_\_\_\_\_\_\_\_\_\_

a) the system does not crash due to deadlock occurrence

b) the system can allocate resources to each process in some order and still avoid a deadlock

c) the state keeps the system protected and safe

d) all of the mentioned

Answer: the system can allocate resources to each process in some order and still avoid a deadlock

3. If no cycle exists in the resource allocation graph \_\_\_\_\_\_\_\_\_\_\_\_

a) then the system will not be in a safe state

b) then the system will be in a safe state

c) all of the mentioned

d) none of the mentioned

Answer: then the system will be in a safe state

4. All unsafe states are \_\_\_\_\_\_\_\_\_\_\_\_

a) deadlocks

b) not deadlocks

c) fatal

d) none of the mentioned

Answer: not deadlocks

5. The data structures available in the Banker’s algorithm are \_\_\_\_\_\_\_\_\_\_\_\_

a) Available

b) Need

c) Allocation

d) All of the mentioned

Answer: All of the mentioned

6. The resource allocation graph is not applicable to a resource allocation system \_\_\_\_\_\_\_\_\_\_\_\_

a) with multiple instances of each resource type

b) with a single instance of each resource type

c) single & multiple instances of each resource type

d) none of the mentioned

Answer: with multiple instances of each resource type

7. Given a priori information about the \_\_\_\_\_\_\_\_ number of resources of each type that maybe requested for each process, it is possible to construct an algorithm that ensures that the system will never enter a deadlock state.

a) minimum

b) average

c) maximum

d) approximate

Answer: maximum

8. A system is in a safe state only if there exists a \_\_\_\_\_\_\_\_\_\_\_\_

a) safe allocation

b) safe resource

c) safe sequence

d) all of the mentioned

Answer: safe sequence

9. A deadlock avoidance algorithm dynamically examines the \_\_\_\_\_\_\_\_\_\_ to ensure that a circular wait condition can never exist.

a) resource allocation state

b) system storage state

c) operating system

d) resources

Answer: resource allocation state

10. Each request requires that the system consider the \_\_\_\_\_\_\_\_\_\_\_\_\_ to decide whether the current request can be satisfied or must wait to avoid a future possible deadlock.

a) resources currently available

b) processes that have previously been in the system

c) resources currently allocated to each process

d) future requests and releases of each process

Answer: resources currently available

11. The Banker’s algorithm is \_\_\_\_\_\_\_\_\_\_\_\_\_ than the resource allocation graph algorithm.

a) less efficient

b) more efficient

c) equal

d) none of the mentioned

Answer: less efficient

12. A system with 5 processes P0 through P4 and three resource types A, B, C have A with 10 instances, B with 5 instances, and C with 7 instances. At time t0, the following snapshot has been taken:

Process

P0

P1

P2

P3

P4

Allocation (process-wise : P0 through P4 top TO bottom)

A   B   C

0   1   0

2   0   0

3   0   2

2   1   1

0   0   2

MAX (process-wise: P0 through P4 top TO bottom)

A   B   C

7   5   3

3   2   2

9   0   2

2   2   2

4   3   3

Available

A   B   C

3   3   2

The sequence <P1, P3, P4, P2, P0> leads the system to \_\_\_\_\_\_\_\_\_\_\_\_

a) an unsafe state

b) a safe state

c) a protected state

d) a deadlock

Answer: a safe state

13. A system has 12 magnetic tape drives and 3 processes : P0, P1, and P2. Process P0 requires 10 tape drives, P1 requires 4 and P2 requires 9 tape drives.

Process

P0

P1

P2

Maximum needs (process-wise: P0 through P2 top to bottom)

10

4

9

Currently allocated (process-wise)

5

2

2

Which of the following sequence is a safe sequence?

a) P0, P1, P2

b) P1, P2, P0

c) P2, P0, P1

d) P1, P0, P2

Answer: P1, P0, P2

**Deadlock Recovery MCQ**

1. If we preempt a resource from a process, the process cannot continue with its normal execution and it must be \_\_\_\_\_\_\_\_\_\_\_\_

a) aborted

b) rolled back

c) terminated

d) queued

Answer: rolled back

2. Cost factors for process termination include \_\_\_\_\_\_\_\_\_\_\_\_

a) Number of resources the deadlock process is not holding

b) CPU utilization at the time of deadlock

c) Amount of time a deadlocked process has thus far consumed during its execution

d) All of the mentioned

Answer: Amount of time a deadlocked process has thus far consumed during its execution

3. The two ways of aborting processes and eliminating deadlocks are \_\_\_\_\_\_\_\_\_\_\_\_

a) Abort all deadlocked processes

b) Abort all processes

c) Abort one process at a time until the deadlock cycle is eliminated

d) All of the mentioned

Answer: Abort one process at a time until the deadlock cycle is eliminated

4. A deadlock can be broken by \_\_\_\_\_\_\_\_\_\_\_\_

a) abort one or more processes to break the circular wait

b) abort all the process in the system

c) preempt all resources from all processes

d) none of the mentioned

Answer: abort one or more processes to break the circular wait

5. If the resources are always preempted from the same process \_\_\_\_\_\_\_\_\_\_ can occur.

a) deadlock

b) system crash

c) aging

d) starvation

Answer: starvation

6. To \_\_\_\_\_\_\_ to a safe state, the system needs to keep more information about the states of processes.

a) abort the process

b) roll back the process

c) queue the process

d) none of the mentioned

Answer: roll back the process

7. Those processes should be aborted on occurrence of a deadlock, the termination of which?

a) is more time consuming

b) incurs minimum cost

c) safety is not hampered

d) all of the mentioned

Answer: incurs minimum cost

8. What is the solution to starvation?

a) the number of rollbacks must be included in the cost factor

b) the number of resources must be included in resource preemption

c) resource preemption be done instead

d) all of the mentioned

Answer: the number of rollbacks must be included in the cost factor

9. The process to be aborted is chosen on the basis of the following factors?

a) priority of the process

b) process is interactive or batch

c) how long the process has computed

d) all of the mentioned

Answer: all of the mentioned

**Deadlock Detection MCQ**

1. If deadlocks occur frequently, the detection algorithm must be invoked \_\_\_\_\_\_\_\_

a) rarely

b) frequently

c) rarely & frequently

d) none of the mentioned

Answer: frequently

2. Every time a request for allocation cannot be granted immediately, the detection algorithm is invoked. This will help identify \_\_\_\_\_\_\_\_\_\_\_\_

a) the set of processes that have been deadlocked

b) the set of processes in the deadlock queue

c) the specific process that caused the deadlock

d) all of the mentioned

Answer: the set of processes that have been deadlocked

3. The wait-for graph is a deadlock detection algorithm that is applicable when \_\_\_\_\_\_\_\_\_\_\_\_

a) all resources have a single instance

b) all resources have multiple instances

c) all resources have a single 7 multiple instances

d) all of the mentioned

Answer: all resources have a single instance

4. ‘m’ processes share ‘n’ resources of the same type. The maximum need of each process doesn’t exceed ‘n’ and the sum of all their maximum needs is always less than m+n. In this setup, deadlock \_\_\_\_\_\_\_\_\_\_\_\_

a) can never occur

b) may occur

c) has to occur

d) none of the mentioned

Answer: can never occur

5. A deadlock eventually cripples system throughput and will cause the CPU utilization to \_\_\_\_\_\_

a) increase

b) drop

c) stay still

d) none of the mentioned

Answer: drop

6. An edge from process Pi to Pj in a wait for graph indicates that \_\_\_\_\_\_\_\_\_\_\_\_

a) Pi is waiting for Pj to release a resource that Pi needs

b) Pj is waiting for Pi to release a resource that Pj needs

c) Pi is waiting for Pj to leave the system

d) Pj is waiting for Pi to leave the system

Answer: Pi is waiting for Pj to release a resource that Pi needs

7. A system has 3 processes sharing 4 resources. If each process needs a maximum of 2 units then, deadlock \_\_\_\_\_\_\_\_\_\_\_\_

a) can never occur

b) may occur

c) has to occur

d) none of the mentioned

Answer: can never occur

8. If the wait for graph contains a cycle \_\_\_\_\_\_\_\_\_\_\_\_

a) then a deadlock does not exist

b) then a deadlock exists

c) then the system is in a safe state

d) either deadlock exists or system is in a safe state

Answer: then a deadlock exists

9. A computer system has 6 tape drives, with ‘n’ processes competing for them. Each process may need 3 tape drives. The maximum value of ‘n’ for which the system is guaranteed to be deadlock free is?

a) 2

b) 3

c) 4

d) 1

Answer: 2

10. What is the disadvantage of invoking the detection algorithm for every request?

a) overhead of the detection algorithm due to consumption of memory

b) excessive time consumed in the request to be allocated memory

c) considerable overhead in computation time

d) all of the mentioned

Answer: considerable overhead in computation time