OPERATING SYSTEM MCQS

BASIC:--------------------------

1. What is an operating system?
a) collection of programs that manages hardware resources
b) system service provider to the application programs
c) interface between the hardware and application programs
d) all of the mentioned
2. To access the services of operating system, the interface is provided by the _____
a) System calls
b) API
c) Library
d) Assembly instructions
3. Which one of the following is not true?
a) kernel is the program that constitutes the central core of the operating system
b) kernel is the first part of operating system to load into memory during booting
c) kernel is made of various modules which can not be loaded in running operating system
d) kernel remains in the memory during the entire computer session
4. Which one of the following error will be handle by the operating system?
a) power failure
b) lack of paper in printer
c) connection failure in the network
d) all of the mentioned
5. What is the main function of the command interpreter?
a) to get and execute the next user-specified command
b) to provide the interface between the API and application program
c) to handle the files in operating system
d) none of the mentioned
6. In Operating Systems, which of the following is/are CPU scheduling algorithms?
a) Round Robin
b) Shortest Job First
c) Priority
d) All of the mentioned
7. If a process fails, most operating system write the error information to a _____
a) log file
b) another running process
c) new file
d) none of the mentioned
8. Which facility dynamically adds probes to a running system, both in user processes and in the kernel?
a) DTrace
b) DLocate
c) DMap
d) DAdd

9. Which one of the following is not a real time operating system?
a) VxWorks
b) QNX
c) RTLinux
d) Palm OS

10. The OS X has _____
a) monolithic kernel
b) hybrid kernel
c) microkernel
d) monolithic kernel with modules

PROCESS:---------------------------------

1. The systems which allow only one process execution at a time, are called _____
a) uniprogramming systems
b) uniprocessing systems
c) unitasking systems
d) none of the mentioned

2. In operating system, each process has its own _____
a) address space and global variables
b) open files
c) pending alarms, signals and signal handlers
d) all of the mentioned

3. In Unix, Which system call creates the new process?
a) fork
b) create
c) new
d) none of the mentioned

4. A process can be terminated due to _____
a) normal exit
b) fatal error
c) killed by another process
d) all of the mentioned

5. What is the ready state of a process?
a) when process is scheduled to run after some execution
b) when process is unable to run until some task has been completed
c) when process is using the CPU
d) none of the mentioned

6. What is interprocess communication?
a) communication within the process
b) communication between two process
c) communication between two threads of same process
d) none of the mentioned

7. A set of processes is deadlock if _____
a) each process is blocked and will remain so forever
b) each process is terminated

c) all processes are trying to kill each other
d) none of the mentioned
8. A process stack does not contain _____
a) Function parameters
b) Local variables
c) Return addresses
d) PID of child process
9. Which system call can be used by a parent process to determine the termination of child process?
a) wait
b) exit
c) fork
d) get
10. The address of the next instruction to be executed by the current process is provided by the _____
a) CPU registers
b) Program counter
c) Process stack
d) Pipe

PROCESS CONTROL BLOCK:-------------------------------------

1. A Process Control Block(PCB) does not contain which of the following?
a) Code
b) Stack
c) Bootstrap program
d) Data
2. The number of processes completed per unit time is known as _____
a) Output
b) Throughput
c) Efficiency
d) Capacity
3. The state of a process is defined by _____
a) the final activity of the process
b) the activity just executed by the process
c) the activity to next be executed by the process
d) the current activity of the process
4. Which of the following is not the state of a process?
a) New
b) Old
c) Waiting
d) Running
5. What is a Process Control Block?
a) Process type variable
b) Data Structure
c) A secondary storage section
d) A Block in memory

6. The entry of all the PCBs of the current processes is in _____
a) Process Register
b) Program Counter
c) Process Table
d) Process Unit

7. What is the degree of multiprogramming?
a) the number of processes executed per unit time
b) the number of processes in the ready queue
c) the number of processes in the I/O queue
d) the number of processes in memory

8. A single thread of control allows the process to perform _____
a) only one task at a time
b) multiple tasks at a time
c) only two tasks at a time
d) all of the mentioned

9. What is the objective of multiprogramming?
a) Have a process running at all time
b) Have multiple programs waiting in a queue ready to run
c) To increase CPU utilization
d) None of the mentioned

Process Scheduling Queues:---------------------------
1. Which of the following do not belong to queues for processes?
a) Job Queue
b) PCB queue
c) Device Queue
d) Ready Queue

2. When the process issues an I/O request _____
a) It is placed in an I/O queue
b) It is placed in a waiting queue
c) It is placed in the ready queue
d) It is placed in the Job queue

3. What will happen when a process terminates?
a) It is removed from all queues
b) It is removed from all, but the job queue
c) Its process control block is de-allocated
d) Its process control block is never de-allocated

4. What is a long-term scheduler?
a) It selects processes which have to be brought into the ready queue
b) It selects processes which have to be executed next and allocates CPU
c) It selects processes which heave to remove from memory by swapping
d) None of the mentioned

5. If all processes I/O bound, the ready queue will almost always be _____ and the Short term Scheduler will have a _____ to do.
a) full, little
b) full, lot
c) empty, little
d) empty, lot

6. What is a medium-term scheduler?
a) It selects which process has to be brought into the ready queue
b) It selects which process has to be executed next and allocates CPU
c) It selects which process to remove from memory by swapping
d) None of the mentioned

7. What is a short-term scheduler?
a) It selects which process has to be brought into the ready queue
b) It selects which process has to be executed next and allocates CPU
c) It selects which process to remove from memory by swapping
d) None of the mentioned

8. The primary distinction between the short term scheduler and the long term scheduler is _____
a) The length of their queues
b) The type of processes they schedule
c) The frequency of their execution
d) None of the mentioned

9. The only state transition that is initiated by the user process itself is _____
a) block
b) wakeup
c) dispatch
d) none of the mentioned

10. In a time-sharing operating system, when the time slot given to a process is completed, the process goes from the running state to the _____
a) Blocked state
b) Ready state
c) Suspended state
d) Terminated state

11. In a multiprogramming environment _____
a) the processor executes more than one process at a time
b) the programs are developed by more than one person
c) more than one process resides in the memory
d) a single user can execute many programs at the same time

12. Suppose that a process is in "Blocked" state waiting for some I/O service. When the service is completed, it goes to the _____
a) Running state
b) Ready state
c) Suspended state
d) Terminated state

13. The context of a process in the PCB of a process does not contain _____
a) the value of the CPU registers
b) the process state
c) memory-management information
d) context switch time

14. Which of the following need not necessarily be saved on a context switch between processes?
a) General purpose registers
b) Translation lookaside buffer

c) Program counter
d) All of the mentioned
15. Which of the following does not interrupt a running process?
a) A device
b) Timer
c) Scheduler process
d) Power failure
Process Synchronization:----------------------------

1. Which process can be affected by other processes executing in the system?
a) cooperating process
b) child process
c) parent process
d) init process
2. When several processes access the same data concurrently and the outcome of the execution depends on the particular order in which the access takes place is called _____
a) dynamic condition
b) race condition
c) essential condition
d) critical condition
3. If a process is executing in its critical section, then no other processes can be executing in their critical section. What is this condition called?
a) mutual exclusion
b) critical exclusion
c) synchronous exclusion
d) asynchronous exclusion
4. Which one of the following is a synchronization tool?
a) thread
b) pipe
c) semaphore
d) socket
5. A semaphore is a shared integer variable _____
a) that can not drop below zero
b) that can not be more than zero
c) that can not drop below one
d) that can not be more than one
6. Mutual exclusion can be provided by the _____
a) mutex locks
b) binary semaphores
c) both mutex locks and binary semaphores
d) none of the mentioned
7. When high priority task is indirectly preempted by medium priority task effectively inverting the relative priority of the two tasks, the scenario is called _____
a) priority inversion
b) priority removal

c) priority exchange

d) priority modification

8. Process synchronization can be done on _____

a) hardware level

b) software level

c) both hardware and software level

d) none of the mentioned

9. A monitor is a module that encapsulates _____

a) shared data structures

b) procedures that operate on shared data structure

c) synchronization between concurrent procedure invocation

d) all of the mentioned

10. To enable a process to wait within the monitor _____

a) a condition variable must be declared as condition

b) condition variables must be used as boolean objects

c) semaphore must be used

d) all of the mentioned

PROCESS CREATION:---------------------

1. Restricting the child process to a subset of the parent's resources prevents any process from _____

a) overloading the system by using a lot of secondary storage

b) under-loading the system by very less CPU utilization

c) overloading the system by creating a lot of sub-processes

d) crashing the system by utilizing multiple resources

2. A parent process calling _____ system call will be suspended until children processes terminate.

a) wait

b) fork

c) exit

d) exec

3. Cascading termination refers to termination of all child processes if the parent process terminates _____

a) Normally

b) Abnormally

c) Normally or abnormally

d) None of the mentioned

4. With _____ only one process can execute at a time; meanwhile all other process are waiting for the processor. With _____ more than one process can be running simultaneously each on a different processor.

a) Multiprocessing, Multiprogramming

b) Multiprogramming, Uniprocessing

c) Multiprogramming, Multiprocessing

d) Uniprogramming, Multiprocessing

5. In UNIX, each process is identified by its _____

a) Process Control Block

b) Device Queue
c) Process Identifier
d) None of the mentioned
6. In UNIX, the return value for the fork system call is _____ for the child process and _____ for the parent process.
a) A Negative integer, Zero
b) Zero, A Negative integer
c) Zero, A nonzero integer
d) A nonzero integer, Zero
7. The child process can _____
a) be a duplicate of the parent process
b) never be a duplicate of the parent process
c) cannot have another program loaded into it
d) never have another program loaded into it
8. The child process completes execution, but the parent keeps executing, then the child process is known as _____
a) Orphan
b) Zombie
c) Body
d) Dead

PROCESS STRUCTURE---

1. The initial program that is run when the computer is powered up is called _____
a) boot program
b) bootloader
c) initializer
d) bootstrap program
2. How does the software trigger an interrupt?
a) Sending signals to CPU through bus
b) Executing a special operation called system call
c) Executing a special program called system program
d) Executing a special program called interrupt trigger program
3. What is a trap/exception?
a) hardware generated interrupt caused by an error
b) software generated interrupt caused by an error
c) user generated interrupt caused by an error
d) none of the mentioned
4. What is an ISR?
a) Information Service Request
b) Interrupt Service Request
c) Interrupt Service Routine
d) Information Service Routine

5. What is an interrupt vector?
a) It is an address that is indexed to an interrupt handler
b) It is a unique device number that is indexed by an address
c) It is a unique identity given to an interrupt
d) None of the mentioned
6. DMA is used for _____
a) High speed devices(disks and communications network)
b) Low speed devices
c) Utilizing CPU cycles
d) All of the mentioned
7. In a memory mapped input/output _____
a) the CPU uses polling to watch the control bit constantly, looping to see if a device is ready
b) the CPU writes one data byte to the data register and sets a bit in control register to show that a byte is available
c) the CPU receives an interrupt when the device is ready for the next byte
d) the CPU runs a user written code and does accordingly
8. In a programmed input/output(PIO) _____
a) the CPU uses polling to watch the control bit constantly, looping to see if a device is ready
b) the CPU writes one data byte to the data register and sets a bit in control register to show that a byte is available
c) the CPU receives an interrupt when the device is ready for the next byte
d) the CPU runs a user written code and does accordingly
9. In an interrupt driven input/output _____
a) the CPU uses polling to watch the control bit constantly, looping to see if a device is ready
b) the CPU writes one data byte to the data register and sets a bit in control register to show that a byte is available
c) the CPU receives an interrupt when the device is ready for the next byte
d) the CPU runs a user written code and does accordingly
10. In the layered approach of Operating Systems _____
a) Bottom Layer(0) is the User interface
b) Highest Layer(N) is the User interface
c) Bottom Layer(N) is the hardware
d) Highest Layer(N) is the hardware
11. How does the Hardware trigger an interrupt?
a) Sending signals to CPU through a system bus
b) Executing a special program called interrupt program
c) Executing a special program called system program
d) Executing a special operation called system call
12. Which operation is performed by an interrupt handler?
a) Saving the current state of the system
b) Loading the interrupt handling code and executing it
c) Once done handling, bringing back the system to the original state it was before the interrupt occurred
d) All of the mentioned
PROCESS COMMUNICATION:----
1. What is Interprocess communication?
a) allows processes to communicate and synchronize their actions when using the same

address space

b) allows processes to communicate and synchronize their actions

c) allows the processes to only synchronize their actions without communication

d) none of the mentioned

2. Message passing system allows processes to _____

a) communicate with each other without sharing the same address space

b) communicate with one another by resorting to shared data

c) share data

d) name the recipient or sender of the message

3. Which of the following two operations are provided by the IPC facility?

a) write & delete message

b) delete & receive message

c) send & delete message

d) receive & send message

4. Messages sent by a process _____

a) have to be of a fixed size

b) have to be a variable size

c) can be fixed or variable sized

d) none of the mentioned

5. The link between two processes P and Q to send and receive messages is called _____

a) communication link

b) message-passing link

c) synchronization link

d) all of the mentioned

6. Which of the following are TRUE for direct communication?

a) A communication link can be associated with N number of process(N = max. number of processes supported by system)

b) A communication link is associated with exactly two processes

c) Exactly N/2 links exist between each pair of processes(N = max. number of processes supported by system)

d) Exactly two link exists between each pair of processes

7. In indirect communication between processes P and Q _____

a) there is another process R to handle and pass on the messages between P and Q

b) there is another machine between the two processes to help communication

c) there is a mailbox to help communication between P and Q

d) none of the mentioned

8. In the non blocking send _____

a) the sending process keeps sending until the message is received

b) the sending process sends the message and resumes operation

c) the sending process keeps sending until it receives a message

d) none of the mentioned

9. In the Zero capacity queue _____

a) the queue can store at least one message

b) the sender blocks until the receiver receives the message

c) the sender keeps sending and the messages don't wait in the queue

d) none of the mentioned

10. The Zero Capacity queue _____
a) is referred to as a message system with buffering
b) is referred to as a message system with no buffering
c) is referred to as a link
d) none of the mentioned

11. Bounded capacity and Unbounded capacity queues are referred to as _____
a) Programmed buffering
b) Automatic buffering
c) User defined buffering
d) No buffering

CPU SCHEDULING:---------------------

1. Which module gives control of the CPU to the process selected by the short-term scheduler?
a) dispatcher
b) interrupt
c) scheduler
d) none of the mentioned

2. The processes that are residing in main memory and are ready and waiting to execute are kept on a list called _____
a) job queue
b) ready queue
c) execution queue
d) process queue

3. The interval from the time of submission of a process to the time of completion is termed as _____
a) waiting time
b) turnaround time
c) response time
d) throughput

4. Which scheduling algorithm allocates the CPU first to the process that requests the CPU first?
a) first-come, first-served scheduling
b) shortest job scheduling
c) priority scheduling
d) none of the mentioned

5. In priority scheduling algorithm _____
a) CPU is allocated to the process with highest priority
b) CPU is allocated to the process with lowest priority
c) Equal priority processes can not be scheduled
d) None of the mentioned

6. In priority scheduling algorithm, when a process arrives at the ready queue, its priority is compared with the priority of _____
a) all process
b) currently running process
c) parent process
d) init process

7. Which algorithm is defined in Time quantum?
a) shortest job scheduling algorithm
b) round robin scheduling algorithm
c) priority scheduling algorithm
d) multilevel queue scheduling algorithm
8. Process are classified into different groups in _____
a) shortest job scheduling algorithm
b) round robin scheduling algorithm
c) priority scheduling algorithm
d) multilevel queue scheduling algorithm
9. In multilevel feedback scheduling algorithm _____
a) a process can move to a different classified ready queue
b) classification of ready queue is permanent
c) processes are not classified into groups
d) none of the mentioned
10. Which one of the following can not be scheduled by the kernel?
a) kernel level thread
b) user level thread
c) process
d) none of the mentioned

TERMS:------------

1. CPU scheduling is the basis of _____
a) multiprocessor systems
b) multiprogramming operating systems
c) larger memory sized systems
d) none of the mentioned
2. With multiprogramming _____ is used productively.
a) time
b) space
c) money
d) all of the mentioned
3. What are the two steps of a process execution?
a) I/O & OS Burst
b) CPU & I/O Burst
c) Memory & I/O Burst
d) OS & Memory Burst
4. An I/O bound program will typically have _____
a) a few very short CPU bursts
b) many very short I/O bursts
c) many very short CPU bursts
d) a few very short I/O bursts
5. A process is selected from the _____ queue by the _____ scheduler, to be executed.
a) blocked, short term
b) wait, long term

c) ready, short term
d) ready, long term
6. In the following cases non – preemptive scheduling occurs?
a) When a process switches from the running state to the ready state
b) When a process goes from the running state to the waiting state
c) When a process switches from the waiting state to the ready state
d) All of the mentioned
7. The switching of the CPU from one process or thread to another is called _____
a) process switch
b) task switch
c) context switch
d) all of the mentioned
8. What is Dispatch latency?
a) the speed of dispatching a process from running to the ready state
b) the time of dispatching a process from running to ready state and keeping the CPU idle
c) the time to stop one process and start running another one
d) none of the mentioned
9. Scheduling is done so as to _____
a) increase CPU utilization
b) decrease CPU utilization
c) keep the CPU more idle
d) none of the mentioned
10. Scheduling is done so as to _____
a) increase the throughput
b) decrease the throughput
c) increase the duration of a specific amount of work
d) none of the mentioned
11. What is Turnaround time?
a) the total waiting time for a process to finish execution
b) the total time spent in the ready queue
c) the total time spent in the running queue
d) the total time from the completion till the submission of a process
12. Scheduling is done so as to _____
a) increase the turnaround time
b) decrease the turnaround time
c) keep the turnaround time same
d) there is no relation between scheduling and turnaround time
13. What is Waiting time?
a) the total time in the blocked and waiting queues
b) the total time spent in the ready queue
c) the total time spent in the running queue
d) the total time from the completion till the submission of a process
14. Scheduling is done so as to _____
a) increase the waiting time
b) keep the waiting time the same
c) decrease the waiting time
d) none of the mentioned

15. What is Response time?
a) the total time taken from the submission time till the completion time
b) the total time taken from the submission time till the first response is produced
c) the total time taken from submission time till the response is output
d) none of the mentioned

ALGORITHM ---

1. Round robin scheduling falls under the category of _____
a) Non-preemptive scheduling
b) Preemptive scheduling
c) All of the mentioned
d) None of the mentioned
2. With round robin scheduling algorithm in a time shared system _____
a) using very large time slices converts it into First come First served scheduling algorithm
b) using very small time slices converts it into First come First served scheduling algorithm
c) using extremely small time slices increases performance
d) using very small time slices converts it into Shortest Job First algorithm
3. The portion of the process scheduler in an operating system that dispatches processes is concerned with _____
a) assigning ready processes to CPU
b) assigning ready processes to waiting queue
c) assigning running processes to blocked queue
d) all of the mentioned
4. Complex scheduling algorithms _____
a) are very appropriate for very large computers
b) use minimal resources
c) use many resources
d) all of the mentioned
5. What is FIFO algorithm?
a) first executes the job that came in last in the queue
b) first executes the job that came in first in the queue
c) first executes the job that needs minimal processor
d) first executes the job that has maximum processor needs
6. The strategy of making processes that are logically runnable to be temporarily suspended is called _____
a) Non preemptive scheduling
b) Preemptive scheduling
c) Shortest job first
d) First come First served
7. What is Scheduling?
a) allowing a job to use the processor
b) making proper use of processor
c) all of the mentioned
d) none of the mentioned
8. There are 10 different processes running on a workstation. Idle processes are waiting for an input event in the input queue. Busy processes are scheduled with the Round-Robin time

sharing method. Which out of the following quantum times is the best value for small response times, if the processes have a short runtime, e.g. less than 10ms?
a) tQ = 15ms
b) tQ = 40ms
c) tQ = 45ms
d) tQ = 50ms

9. Orders are processed in the sequence they arrive if _____ rule sequences the jobs.
a) earliest due date
b) slack time remaining
c) first come, first served
d) critical ratio

10. Which of the following algorithms tends to minimize the process flow time?
a) First come First served
b) Shortest Job First
c) Earliest Deadline First
d) Longest Job First

11. Under multiprogramming, turnaround time for short jobs is usually _____ and that for long jobs is slightly _____
a) Lengthened; Shortened
b) Shortened; Lengthened
c) Shortened; Shortened
d) Shortened; Unchanged

12. Which of the following statements are true? (GATE 2010)

I. Shortest remaining time first scheduling may cause starvation

II. Preemptive scheduling may cause starvation

III. Round robin is better than FCFS in terms of response time

a) I only
b) I and III only
c) II and III only
d) I, II and III

1. Which is the most optimal scheduling algorithm?
a) FCFS – First come First served
b) SJF – Shortest Job First
c) RR – Round Robin
d) None of the mentioned

2. The real difficulty with SJF in short term scheduling is _____
a) it is too good an algorithm
b) knowing the length of the next CPU request
c) it is too complex to understand
d) none of the mentioned

3. The FCFS algorithm is particularly troublesome for _____

a) time sharing systems

b) multiprogramming systems

c) multiprocessor systems

d) operating systems

4. Consider the following set of processes, the length of the CPU burst time given in milliseconds.

Process	Burst time
P1	6
P2	8
P3	7
P4	3

Assuming the above process being scheduled with the SJF scheduling algorithm.

a) The waiting time for process P1 is 3ms

b) The waiting time for process P1 is 0ms

c) The waiting time for process P1 is 16ms

d) The waiting time for process P1 is 9ms

5. Preemptive Shortest Job First scheduling is sometimes called _____

a) Fast SJF scheduling

b) EDF scheduling – Earliest Deadline First

c) HRRN scheduling – Highest Response Ratio Next

d) SRTN scheduling – Shortest Remaining Time Next

6. An SJF algorithm is simply a priority algorithm where the priority is _____

a) the predicted next CPU burst

b) the inverse of the predicted next CPU burst

c) the current CPU burst

d) anything the user wants

7. Choose one of the disadvantages of the priority scheduling algorithm?

a) it schedules in a very complex manner

b) its scheduling takes up a lot of time

c) it can lead to some low priority process waiting indefinitely for the CPU

d) none of the mentioned

8. What is 'Aging'?

a) keeping track of cache contents

b) keeping track of what pages are currently residing in memory

c) keeping track of how many times a given page is referenced

d) increasing the priority of jobs to ensure termination in a finite time

9. A solution to the problem of indefinite blockage of low – priority processes is _____

a) Starvation

b) Wait queue

c) Ready queue

d) Aging

10. Which of the following statements are true? (GATE 2010)

i) Shortest remaining time first scheduling may cause starvation

ii) Preemptive scheduling may cause starvation

iii) Round robin is better than FCFS in terms of response time

a) i only
b) i and iii only
c) ii and iii only
d) i, ii and iii
11. Which of the following scheduling algorithms gives minimum average waiting time?
a) FCFS
b) SJF
c) Round – robin
d) Priority

DEADLOCK:--

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

1. 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
2. The request and release of resources are _____
a) command line statements
b) interrupts
c) system calls
d) special programs
3. 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
4. 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
5. 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

6. 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

7. 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

8. For non sharable resources like a printer, mutual exclusion _____

a) must exist

b) must not exist

c) may exist

d) none of the mentioned

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

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

11. 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

12. 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

13. 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

1. 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
2. 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
3. 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
4. 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
5. 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
6. All unsafe states are _____
a) deadlocks
b) not deadlocks
c) fatal
d) none of the mentioned
7. 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

8. 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

9. 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

10. The Banker's algorithm is _____ than the resource allocation graph algorithm.
a) less efficient
b) more efficient
c) equal
d) none of the mentioned

11. The data structures available in the Banker's algorithm are _____
a) Available
b) Need
c) Allocation
d) All of the mentioned

12. The content of the matrix Need is _____
a) Allocation – Available
b) Max – Available
c) Max – Allocation
d) Allocation – Max

13. 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

1. 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
2. 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
3. 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
4. If deadlocks occur frequently, the detection algorithm must be invoked _____
a) rarely

b) frequently
c) rarely & frequently
d) none of the mentioned
5. 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
6. 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
7. 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
8. 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
9. 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
10. '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

1. 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

2. 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
3. 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
4. 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
5. 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
6. 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
7. 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
8. If the resources are always preempted from the same process _____ can occur.
a) deadlock
b) system crash
c) aging
d) starvation
9. 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

SYNCHRONIZATION
1. Concurrent access to shared data may result in _____
a) data consistency

b) data insecurity
c) data inconsistency
d) none of the mentioned

2. A situation where several processes access and manipulate the same data concurrently and the outcome of the execution depends on the particular order in which access takes place is called _____
a) data consistency
b) race condition
c) aging
d) starvation

3. The segment of code in which the process may change common variables, update tables, write into files is known as _____
a) program
b) critical section
c) non – critical section
d) synchronizing

4. Which of the following conditions must be satisfied to solve the critical section problem?
a) Mutual Exclusion
b) Progress
c) Bounded Waiting
d) All of the mentioned

5. Mutual exclusion implies that _____
a) if a process is executing in its critical section, then no other process must be executing in their critical sections
b) if a process is executing in its critical section, then other processes must be executing in their critical sections
c) if a process is executing in its critical section, then all the resources of the system must be blocked until it finishes execution
d) none of the mentioned

6. Bounded waiting implies that there exists a bound on the number of times a process is allowed to enter its critical section _____
a) after a process has made a request to enter its critical section and before the request is granted
b) when another process is in its critical section
c) before a process has made a request to enter its critical section
d) none of the mentioned

7. A minimum of _____ variable(s) is/are required to be shared between processes to solve the critical section problem.
a) one
b) two
c) three
d) four

8. In the bakery algorithm to solve the critical section problem _____
a) each process is put into a queue and picked up in an ordered manner
b) each process receives a number (may or may not be unique) and the one with the lowest number is served next

c) each process gets a unique number and the one with the highest number is served next
d) each process gets a unique number and the one with the lowest number is served next

1. An un-interruptible unit is known as _____
a) single
b) atomic
c) static
d) none of the mentioned
2. TestAndSet instruction is executed _____
a) after a particular process
b) periodically
c) atomically
d) none of the mentioned
3. Semaphore is a/an _____ to solve the critical section problem.
a) hardware for a system
b) special program for a system
c) integer variable
d) none of the mentioned
4. What are the two atomic operations permissible on semaphores?
a) wait
b) stop
c) hold
d) none of the mentioned
5. What are Spinlocks?
a) CPU cycles wasting locks over critical sections of programs
b) Locks that avoid time wastage in context switches
c) Locks that work better on multiprocessor systems
d) All of the mentioned
6. What is the main disadvantage of spinlocks?
a) they are not sufficient for many process
b) they require busy waiting
c) they are unreliable sometimes
d) they are too complex for programmers
7. The wait operation of the semaphore basically works on the basic _____ system call.
a) stop()
b) block()
c) hold()
d) wait()
8. The signal operation of the semaphore basically works on the basic _____ system call.
a) continue()
b) wakeup()
c) getup()
d) start()
9. If the semaphore value is negative _____
a) its magnitude is the number of processes waiting on that semaphore
b) it is invalid

c) no operation can be further performed on it until the signal operation is performed on it

d) none of the mentioned

10. The code that changes the value of the semaphore is _____

a) remainder section code

b) non – critical section code

c) critical section code

d) none of the mentioned

11. The following program consists of 3 concurrent processes and 3 binary semaphores. The semaphores are initialized as S0 = 1, S1 = 0, S2 = 0.

```
Process P0
while(true)
{
   wait(S0);
   print '0';
   release(S1);
   release(S2);
}

Process P1
wait(S1);
release(S0);

Process P2
wait(S2);
release(S0);
```

How many times will P0 print '0'?

a) At least twice

b) Exactly twice

c) Exactly thrice

d) Exactly once

12. Each process Pi, i = 0,1,2,3,.......,9 is coded as follows.

```
repeat
 P(mutex)
 {Critical Section}
 V(mutex)
 forever
```

The code for P10 is identical except that it uses V(mutex) instead of P(mutex). What is the largest number of processes that can be inside the critical section at any moment (the mutex being initialized to 1)?

a) 1

b) 2

c) 3

d) None of the mentioned

13. Two processes, P1 and P2, need to access a critical section of code. Consider the following synchronization construct used by the processes.

```
Process P1 :
while(true)
{
w1 = true;
while(w2 == true);
Critical section
w1 = false;
}
Remainder Section

Process P2 :
while(true)
{
w2 = true;
while(w1 == true);
Critical section
w2 = false;
}
Remainder Section
```

Here, w1 and w2 have shared variables, which are initialized to false. Which one of the following statements is TRUE about the above construct?

a) It does not ensure mutual exclusion
b) It does not ensure bounded waiting
c) It requires that processes enter the critical section in strict alternation
d) It does not prevent deadlocks but ensures mutual exclusion

1. What will happen if a non-recursive mutex is locked more than once?
a) Starvation
b) Deadlock
c) Aging
d) Signaling

2. What is a semaphore?
a) is a binary mutex
b) must be accessed from only one process
c) can be accessed from multiple processes
d) none of the mentioned

3. What are the two kinds of semaphores?
a) mutex & counting
b) binary & counting
c) counting & decimal
d) decimal & binary

4. What is a mutex?
a) is a binary mutex
b) must be accessed from only one process
c) can be accessed from multiple processes
d) none of the mentioned

5. At a particular time of computation the value of a counting semaphore is 7.Then 20 P operations and 15 V operations were completed on this semaphore. The resulting value of

the semaphore is? (GATE 1987)

a) 42

b) 2

c) 7

d) 12

6. A binary semaphore is a semaphore with integer values _____

a) 1

b) -1

c) 0.8

d) 0.5

7. The following pair of processes share a common variable X.

```
Process A
int Y;
A1: Y = X*2;
A2: X = Y;

Process B
int Z;
B1: Z = X+1;
B2: X = Z;
```

X is set to 5 before either process begins execution. As usual, statements within a process are executed sequentially, but statements in process A may execute in any order with respect to statements in process B.

How many different values of X are possible after both processes finish executing?

a) two

b) three

c) four

d) eight

8. The program follows to use a shared binary semaphore T.

```
Process A
int Y;
A1: Y = X*2;
A2: X = Y;
signal(T);

Process B
int Z;
B1: wait(T);
B2: Z = X+1;
X = Z;
```

T is set to 0 before either process begins execution and, as before, X is set to 5.

Now, how many different values of X are possible after both processes finish executing?

a) one

b) two

c) three
d) four
9. Semaphores are mostly used to implement _____
a) System calls
b) IPC mechanisms
c) System protection
d) None of the mentioned
10. Spinlocks are intended to provide _____ only.
a) Mutual Exclusion
b) Bounded Waiting
c) Aging
d) Progress

1. The bounded buffer problem is also known as _____
a) Readers – Writers problem
b) Dining – Philosophers problem
c) Producer – Consumer problem
d) None of the mentioned
2. In the bounded buffer problem, there are the empty and full semaphores that _____
a) count the number of empty and full buffers
b) count the number of empty and full memory spaces
c) count the number of empty and full queues
d) none of the mentioned
3. In the bounded buffer problem _____
a) there is only one buffer
b) there are n buffers (n being greater than one but finite)
c) there are infinite buffers
d) the buffer size is bounded
4. To ensure difficulties do not arise in the readers – writers problem _____ are given exclusive access to the shared object.
a) readers
b) writers
c) readers and writers
d) none of the mentioned
5. The dining – philosophers problem will occur in case of _____
a) 5 philosophers and 5 chopsticks
b) 4 philosophers and 5 chopsticks
c) 3 philosophers and 5 chopsticks
d) 6 philosophers and 5 chopsticks

6. A deadlock free solution to the dining philosophers problem _____
a) necessarily eliminates the possibility of starvation
b) does not necessarily eliminate the possibility of starvation
c) eliminates any possibility of any kind of problem further
d) none of the mentioned

7. All processes share a semaphore variable **mutex**, initialized to 1. Each process must execute wait(mutex) before entering the critical section and signal(mutex) afterward. Suppose a process executes in the following manner.

signal(mutex);

.....

critical section

.....

wait(mutex);

In this situation :

a) a deadlock will occur

b) processes will starve to enter critical section

c) several processes maybe executing in their critical section

d) all of the mentioned

8. All processes share a semaphore variable **mutex**, initialized to 1. Each process must execute wait(mutex) before entering the critical section and signal(mutex) afterward. Suppose a process executes in the following manner.

wait(mutex);

.....

critical section

.....

wait(mutex);

a) a deadlock will occur

b) processes will starve to enter critical section

c) several processes maybe executing in their critical section

d) all of the mentioned

9. Consider the methods used by processes P1 and P2 for accessing their critical sections whenever needed, as given below. The initial values of shared boolean variables S1 and S2 are randomly assigned. (GATE 2010)

Method used by P1 :
while(S1==S2);
Critical section
S1 = S2;

Method used by P2 :
while(S1!=S2);
Critical section
S2 = not(S1);

Which of the following statements describes properties achieved?

a) Mutual exclusion but not progress

b) Progress but not mutual exclusion

c) Neither mutual exclusion nor progress

d) Both mutual exclusion and progress

1. A monitor is a type of _____
a) semaphore
b) low level synchronization construct
c) high level synchronization construct
d) none of the mentioned

2. A monitor is characterized by _____
a) a set of programmer defined operators
b) an identifier
c) the number of variables in it
d) all of the mentioned

3. A procedure defined within a _____ can access only those variables declared locally within the _____ and its formal parameters.
a) process, semaphore
b) process, monitor
c) semaphore, semaphore
d) monitor, monitor

4. The monitor construct ensures that _____
a) only one process can be active at a time within the monitor
b) n number of processes can be active at a time within the monitor (n being greater than 1)
c) the queue has only one process in it at a time
d) all of the mentioned

5. What are the operations that can be invoked on a condition variable?
a) wait & signal
b) hold & wait
c) signal & hold
d) continue & signal

6. Which is the process of invoking the wait operation?
a) suspended until another process invokes the signal operation
b) waiting for another process to complete before it can itself call the signal operation
c) stopped until the next process in the queue finishes execution
d) none of the mentioned

7. If no process is suspended, the signal operation _____
a) puts the system into a deadlock state
b) suspends some default process execution
c) nothing happens
d) the output is unpredictable

1. A collection of instructions that performs a single logical function is called _____
a) transaction
b) operation
c) function
d) all of the mentioned

2. A terminated transaction that has completed its execution successfully is _____ otherwise it is _____
a) committed, destroyed
b) aborted, destroyed

c) committed, aborted

d) none of the mentioned

3. The state of the data accessed by an aborted transaction must be restored to what it was just before the transaction started executing. This restoration is known as _____ of transaction.

a) safety

b) protection

c) roll – back

d) revert – back

4. Write ahead logging is a way _____

a) to ensure atomicity

b) to keep data consistent

c) that records data on stable storage

d) all of the mentioned

5. In the write ahead logging a _____ is maintained.

a) a memory

b) a system

c) a disk

d) a log record

6. An actual update is not allowed to a data item _____

a) before the corresponding log record is written out to stable storage

b) after the corresponding log record is written out to stable storage

c) until the whole log record has been checked for inconsistencies

d) all of the mentioned

7. The undo and redo operations must be _____ to guarantee correct behaviour, even if a failure occurs during recovery process.

a) idempotent

b) easy

c) protected

d) all of the mentioned

8. The system periodically performs checkpoints that consists of the following operation(s) _____

a) Putting all the log records currently in main memory onto stable storage

b) putting all modified data residing in main memory onto stable storage

c) putting a log record onto stable storage

d) all of the mentioned

9. Consider a transaction T1 that committed prior to checkpoint. The <T1 commits> record appears in the log before the <checkpoint> record. Any modifications made by T1 must have been written to the stable storage either with the checkpoint or prior to it. Thus at recovery time _____

a) There is a need to perform an undo operation on T1

b) There is a need to perform a redo operation on T1

c) There is no need to perform an undo and redo operation on T1

d) All of the mentioned

10. Serializable schedules are ones where _____

a) concurrent execution of transactions is equivalent to the transactions executed serially

b) the transactions can be carried out one after the other

c) a valid result occurs after execution transactions
d) none of the mentioned

11. A locking protocol is one that _____
a) governs how locks are acquired
b) governs how locks are released
c) governs how locks are acquired and released
d) none of the mentioned

12. The two phase locking protocol consists of _____
a) growing & shrinking phase
b) shrinking & creation phase
c) creation & growing phase
d) destruction & creation phase

13. The growing phase is a phase in which?
a) A transaction may obtain locks, but does not release any
b) A transaction may obtain locks, and releases a few or all of them
c) A transaction may release locks, but does not obtain any new locks
d) A transaction may release locks, and does obtain new locks

14. The shrinking phase is a phase in which?
a) A transaction may obtain locks, but does not release any
b) A transaction may obtain locks, and releases a few or all of them
c) A transaction may release locks, but does not obtain any new locks
d) A transaction may release locks, and does obtain new locks

15. Which of the following concurrency control protocols ensure both conflict serializability and freedom from deadlock?
I) 2-phase locking
II) Timestamp ordering
a) I only
b) II only
c) Both I and II
d) Neither I nor II

MEMORY MANAGEMENT

1. What is Address Binding?
a) going to an address in memory
b) locating an address with the help of another address
c) binding two addresses together to form a new address in a different memory space
d) a mapping from one address space to another

2. Binding of instructions and data to memory addresses can be done at _____
a) Compile time
b) Load time
c) Execution time
d) All of the mentioned

3. If the process can be moved during its execution from one memory segment to another, then binding must be _____
a) delayed until run time
b) preponed to compile time

c) preponed to load time

d) none of the mentioned

4. What is Dynamic loading?

a) loading multiple routines dynamically

b) loading a routine only when it is called

c) loading multiple routines randomly

d) none of the mentioned

5. What is the advantage of dynamic loading?

a) A used routine is used multiple times

b) An unused routine is never loaded

c) CPU utilization increases

d) All of the mentioned

6. The idea of overlays is to _____

a) data that are needed at any given time

b) enable a process to be larger than the amount of memory allocated to it

c) keep in memory only those instructions

d) all of the mentioned

7. The _____ must design and program the overlay structure.

a) programmer

b) system architect

c) system designer

d) none of the mentioned

8. The _____ swaps processes in and out of the memory.

a) Memory manager

b) CPU

c) CPU manager

d) User

9. If a higher priority process arrives and wants service, the memory manager can swap out the lower priority process to execute the higher priority process. When the higher priority process finishes, the lower priority process is swapped back in and continues execution. This variant of swapping is sometimes called?

a) priority swapping

b) pull out, push in

c) roll out, roll in

d) none of the mentioned

10. If binding is done at assembly or load time, then the process _____ be moved to different locations after being swapped out and in again.

a) can

b) must

c) can never

d) may

11. In a system that does not support swapping _____

a) the compiler normally binds symbolic addresses (variables) to relocatable addresses

b) the compiler normally binds symbolic addresses to physical addresses

c) the loader binds relocatable addresses to physical addresses

d) binding of symbolic addresses to physical addresses normally takes place during execution

12. Which of the following is TRUE?
a) Overlays are used to increase the size of physical memory
b) Overlays are used to increase the logical address space
c) When overlays are used, the size of a process is not limited to the size of the physical memory
d) Overlays are used whenever the physical address space is smaller than the logical address space
1. The address generated by the CPU is referred to as _____
a) Physical address
b) Logical address
c) Neither physical nor logical
d) None of the mentioned
2. The address loaded into the memory address register of the memory is referred to as _____
a) Physical address
b) Logical address
c) Neither physical nor logical
d) None of the mentioned
3. The run time mapping from virtual to physical addresses is done by a hardware device called the _____
a) Virtual to physical mapper
b) Memory management unit
c) Memory mapping unit
d) None of the mentioned
4. The base register is also known as the _____
a) basic register
b) regular register
c) relocation register
d) delocation register
5. The size of a process is limited to the size of _____
a) physical memory
b) external storage
c) secondary storage
d) none of the mentioned
6. If execution time binding is being used, then a process _____ be swapped to a different memory space.
a) has to be
b) can never
c) must
d) may
7. Swapping requires a _____
a) motherboard
b) keyboard
c) monitor
d) backing store
8. The backing store is generally a _____
a) fast disk

b) disk large enough to accommodate copies of all memory images for all users

c) disk to provide direct access to the memory images

d) all of the mentioned

9. The _____ consists of all processes whose memory images are in the backing store or in memory and are ready to run.

a) wait queue

b) ready queue

c) cpu

d) secondary storage

10. The _____ time in a swap out of a running process and swap in of a new process into the memory is very high.

a) context – switch

b) waiting

c) execution

d) all of the mentioned

11. The major part of swap time is _____ time.

a) waiting

b) transfer

c) execution

d) none of the mentioned

12. Swapping _____ be done when a process has pending I/O, or has to execute I/O operations only into operating system buffers.

a) must

b) can

c) must never

d) maybe

13. Swap space is allocated _____

a) as a chunk of disk

b) separate from a file system

c) into a file system

d) all of the mentioned

1. CPU fetches the instruction from memory according to the value of _____

a) program counter

b) status register

c) instruction register

d) program status word

2. A memory buffer used to accommodate a speed differential is called _____

a) stack pointer

b) cache

c) accumulator

d) disk buffer

3. Which one of the following is the address generated by CPU?

a) physical address

b) absolute address

c) logical address

d) none of the mentioned

4. Run time mapping from virtual to physical address is done by _____
a) Memory management unit
b) CPU
c) PCI
d) None of the mentioned
5. Memory management technique in which system stores and retrieves data from secondary storage for use in main memory is called?
a) fragmentation
b) paging
c) mapping
d) none of the mentioned
6. The address of a page table in memory is pointed by _____
a) stack pointer
b) page table base register
c) page register
d) program counter
7. Program always deals with _____
a) logical address
b) absolute address
c) physical address
d) relative address
8. The page table contains _____
a) base address of each page in physical memory
b) page offset
c) page size
d) none of the mentioned
9. What is compaction?
a) a technique for overcoming internal fragmentation
b) a paging technique
c) a technique for overcoming external fragmentation
d) a technique for overcoming fatal error
10. Operating System maintains the page table for _____
a) each process
b) each thread
c) each instruction
d) each address

1. The main memory accommodates _____
a) operating system
b) cpu
c) user processes
d) all of the mentioned
2. What is the operating system?
a) in the low memory
b) in the high memory
c) either low or high memory (depending on the location of interrupt vector)
d) none of the mentioned

3. In contiguous memory allocation _____
a) each process is contained in a single contiguous section of memory
b) all processes are contained in a single contiguous section of memory
c) the memory space is contiguous
d) none of the mentioned

4. The relocation register helps in _____
a) providing more address space to processes
b) a different address space to processes
c) to protect the address spaces of processes
d) none of the mentioned

5. With relocation and limit registers, each logical address must be _____ the limit register.
a) less than
b) equal to
c) greater than
d) none of the mentioned

6. The operating system and the other processes are protected from being modified by an already running process because _____
a) they are in different memory spaces
b) they are in different logical addresses
c) they have a protection algorithm
d) every address generated by the CPU is being checked against the relocation and limit registers

7. Transient operating system code is code that _____
a) is not easily accessible
b) comes and goes as needed
c) stays in the memory always
d) never enters the memory space

8. Using transient code, _____ the size of the operating system during program execution.
a) increases
b) decreases
c) changes
d) maintains

9. When memory is divided into several fixed sized partitions, each partition may contain _____
a) exactly one process
b) at least one process
c) multiple processes at once
d) none of the mentioned

10. In fixed size partition, the degree of multiprogramming is bounded by _____
a) the number of partitions
b) the CPU utilization
c) the memory size
d) all of the mentioned

11. The first fit, best fit and worst fit are strategies to select a _____
a) process from a queue to put in memory
b) processor to run the next process

c) free hole from a set of available holes
d) all of the mentioned

1. In internal fragmentation, memory is internal to a partition and _____
a) is being used
b) is not being used
c) is always used
d) none of the mentioned
2. A solution to the problem of external fragmentation is _____
a) compaction
b) larger memory space
c) smaller memory space
d) none of the mentioned
3. Another solution to the problem of external fragmentation problem is to _____
a) permit the logical address space of a process to be noncontiguous
b) permit smaller processes to be allocated memory at last
c) permit larger processes to be allocated memory at last
d) all of the mentioned
4. If relocation is static and is done at assembly or load time, compaction _____
a) cannot be done
b) must be done
c) must not be done
d) can be done
5. The disadvantage of moving all process to one end of memory and all holes to the other direction, producing one large hole of available memory is _____
a) the cost incurred
b) the memory used
c) the CPU used
d) all of the mentioned
6. _____ is generally faster than _____ and _____
a) first fit, best fit, worst fit
b) best fit, first fit, worst fit
c) worst fit, best fit, first fit
d) none of the mentioned
7. External fragmentation exists when?
a) enough total memory exists to satisfy a request but it is not contiguous
b) the total memory is insufficient to satisfy a request
c) a request cannot be satisfied even when the total memory is free
d) none of the mentioned
8. External fragmentation will not occur when?
a) first fit is used
b) best fit is used
c) worst fit is used
d) no matter which algorithm is used, it will always occur
9. Sometimes the overhead of keeping track of a hole might be _____
a) larger than the memory
b) larger than the hole itself

c) very small
d) all of the mentioned

10. When the memory allocated to a process is slightly larger than the process, then
_____

a) internal fragmentation occurs

b) external fragmentation occurs

c) both internal and external fragmentation occurs

d) neither internal nor external fragmentation occurs

1. Physical memory is broken into fixed-sized blocks called _____
a) frames
b) pages
c) backing store
d) none of the mentioned
2. Logical memory is broken into blocks of the same size called _____
a) frames
b) pages
c) backing store
d) none of the mentioned
3. Every address generated by the CPU is divided into two parts. They are _____
a) frame bit & page number
b) page number & page offset
c) page offset & frame bit
d) frame offset & page offset
4. The _____ is used as an index into the page table.
a) frame bit
b) page number
c) page offset
d) frame offset
5. The _____ table contains the base address of each page in physical memory.
a) process
b) memory
c) page
d) frame
6. The size of a page is typically _____
a) varied
b) power of 2
c) power of 4
d) none of the mentioned
7. If the size of logical address space is 2 to the power of m, and a page size is 2 to the power
of n addressing units, then the high order _____ bits of a logical address designate the page
number, and the _____ low order bits designate the page offset.
a) m, n
b) n, m

c) m – n, m
d) m – n, n
8. With paging there is no _____ fragmentation.
a) internal
b) external
c) either type of
d) none of the mentioned
9. The operating system maintains a _____ table that keeps track of how many frames have been allocated, how many are there, and how many are available.
a) page
b) mapping
c) frame
d) memory
10. Paging increases the _____ time.
a) waiting
b) execution
c) context – switch
d) all of the mentioned
11. Smaller page tables are implemented as a set of _____
a) queues
b) stacks
c) counters
d) registers
12. The page table registers should be built with _____
a) very low speed logic
b) very high speed logic
c) a large memory space
d) none of the mentioned
13. For larger page tables, they are kept in main memory and a _____ points to the page table.
a) page table base register
b) page table base pointer
c) page table register pointer
d) page table base
14. For every process there is a _____
a) page table
b) copy of page table
c) pointer to page table
d) all of the mentioned
15. Time taken in memory access through PTBR is _____
a) extended by a factor of 3
b) extended by a factor of 2
c) slowed by a factor of 3
d) slowed by a factor of 2

1. Each entry in a translation lookaside buffer (TLB) consists of _____
a) key

b) value
c) bit value
d) constant

2. If a page number is not found in the TLB, then it is known as a _____
a) TLB miss
b) Buffer miss
c) TLB hit
d) All of the mentioned

3. An _____ uniquely identifies processes and is used to provide address space protection for that process.
a) address space locator
b) address space identifier
c) address process identifier
d) none of the mentioned

4. The percentage of times a page number is found in the TLB is known as _____
a) miss ratio
b) hit ratio
c) miss percent
d) none of the mentioned

5. Memory protection in a paged environment is accomplished by _____
a) protection algorithm with each page
b) restricted access rights to users
c) restriction on page visibility
d) protection bit with each page

6. When the valid – invalid bit is set to valid, it means that the associated page _____
a) is in the TLB
b) has data in it
c) is in the process's logical address space
d) is the system's physical address space

7. Illegal addresses are trapped using the _____ bit.
a) error
b) protection
c) valid – invalid
d) access

8. When there is a large logical address space, the best way of paging would be _____
a) not to page
b) a two level paging algorithm
c) the page table itself
d) all of the mentioned

9. In a paged memory, the page hit ratio is 0.35. The required to access a page in secondary memory is equal to 100 ns. The time required to access a page in primary memory is 10 ns. The average time required to access a page is?
a) 3.0 ns
b) 68.0 ns

c) 68.5 ns

d) 78.5 ns

10. To obtain better memory utilization, dynamic loading is used. With dynamic loading, a routine is not loaded until it is called. For implementing dynamic loading _____

a) special support from hardware is required

b) special support from operating system is essential

c) special support from both hardware and operating system is essential

d) user programs can implement dynamic loading without any special support from hardware or operating system

11. In paged memory systems, if the page size is increased, then the internal fragmentation generally _____

a) becomes less

b) becomes more

c) remains constant

d) none of the mentioned

1. In segmentation, each address is specified by _____

a) a segment number & offset

b) an offset & value

c) a value & segment number

d) a key & value

2. In paging the user provides only _____ which is partitioned by the hardware into _____ and _____

a) one address, page number, offset

b) one offset, page number, address

c) page number, offset, address

d) none of the mentioned

3. Each entry in a segment table has a _____

a) segment base

b) segment peak

c) segment value

d) none of the mentioned

4. The segment base contains the _____

a) starting logical address of the process

b) starting physical address of the segment in memory

c) segment length

d) none of the mentioned

5. The segment limit contains the _____

a) starting logical address of the process

b) starting physical address of the segment in memory

c) segment length

d) none of the mentioned

6. The offset 'd' of the logical address must be _____

a) greater than segment limit

b) between 0 and segment limit

c) between 0 and the segment number

d) greater than the segment number

7. If the offset is legal _____

a) it is used as a physical memory address itself

b) it is subtracted from the segment base to produce the physical memory address

c) it is added to the segment base to produce the physical memory address

d) none of the mentioned

8. When the entries in the segment tables of two different processes point to the same physical location _____

a) the segments are invalid

b) the processes get blocked

c) segments are shared

d) all of the mentioned

9. The protection bit is 0/1 based on _____

a) write only

b) read only

c) read – write

d) none of the mentioned

10. If there are 32 segments, each of size 1Kb, then the logical address should have

_____

a) 13 bits

b) 14 bits

c) 15 bits

d) 16 bits

11. Consider a computer with 8 Mbytes of main memory and a 128K cache. The cache block size is 4 K. It uses a direct mapping scheme for cache management. How many different main memory blocks can map onto a given physical cache block?

a) 2048

b) 256

c) 64

d) 8

12. A multilevel page table is preferred in comparison to a single level page table for translating virtual address to physical address because _____

a) it reduces the memory access time to read or write a memory location

b) it helps to reduce the size of page table needed to implement the virtual address space of a process

c) it is required by the translation lookaside buffer

d) it helps to reduce the number of page faults in page replacement algorithms

1. Because of virtual memory, the memory can be shared among _____

a) processes

b) threads

c) instructions

d) none of the mentioned

2. _____ is the concept in which a process is copied into the main memory from the secondary memory according to the requirement.

a) Paging

b) Demand paging

c) Segmentation
d) Swapping
3. The pager concerns with the _____
a) individual page of a process
b) entire process
c) entire thread
d) first page of a process
4. Swap space exists in _____
a) primary memory
b) secondary memory
c) cpu
d) none of the mentioned
5. When a program tries to access a page that is mapped in address space but not loaded in physical memory, then _____
a) segmentation fault occurs
b) fatal error occurs
c) page fault occurs
d) no error occurs
6. Effective access time is directly proportional to _____
a) page-fault rate
b) hit ratio
c) memory access time
d) none of the mentioned
7. In FIFO page replacement algorithm, when a page must be replaced _____
a) oldest page is chosen
b) newest page is chosen
c) random page is chosen
d) none of the mentioned
8. Which algorithm chooses the page that has not been used for the longest period of time whenever the page required to be replaced?
a) first in first out algorithm
b) additional reference bit algorithm
c) least recently used algorithm
d) counting based page replacement algorithm
9. A process is thrashing if _____
a) it is spending more time paging than executing
b) it is spending less time paging than executing
c) page fault occurs
d) swapping can not take place
10. Working set model for page replacement is based on the assumption of _____
a) modularity
b) locality
c) globalization
d) random access

1. Virtual memory allows _____
a) execution of a process that may not be completely in memory

b) a program to be smaller than the physical memory
c) a program to be larger than the secondary storage
d) execution of a process without being in physical memory

2. The instruction being executed, must be in _____
a) physical memory
b) logical memory
c) physical & logical memory
d) none of the mentioned

3. Error handler codes, to handle **unusual** errors are _____
a) almost never executed
b) executed very often
c) executed periodically
d) none of the mentioned

4. The ability to execute a program that is only partially in memory has benefits like _____
a) The amount of physical memory cannot put a constraint on the program
b) Programs for an extremely large virtual space can be created
c) Throughput increases
d) All of the mentioned

5. In virtual memory. the programmer _____ of overlays.
a) has to take care
b) does not have to take care
c) all of the mentioned
d) none of the mentioned

6. Virtual memory is normally implemented by _____
a) demand paging
b) buses
c) virtualization
d) all of the mentioned

7. Segment replacement algorithms are more complex than page replacement algorithms because _____
a) Segments are better than pages
b) Pages are better than segments
c) Segments have variable sizes
d) Segments have fixed sizes

8. A swapper manipulates _____ whereas the pager is concerned with individual _____ of a process.
a) the entire process, parts
b) all the pages of a process, segments
c) the entire process, pages
d) none of the mentioned

9. Using a pager _____
a) increases the swap time
b) decreases the swap time
c) decreases the swap time & amount of physical memory needed
d) increases the amount of physical memory needed

10. The valid – invalid bit, in this case, when valid indicates?
a) the page is not legal
b) the page is illegal
c) the page is in memory
d) the page is not in memory

11. A page fault occurs when?
a) a page gives inconsistent data
b) a page cannot be accessed due to its absence from memory
c) a page is invisible
d) all of the mentioned

12. When a page fault occurs, the state of the interrupted process is _____
a) disrupted
b) invalid
c) saved
d) none of the mentioned

13. When a process begins execution with no pages in memory?
a) process execution becomes impossible
b) a page fault occurs for every page brought into memory
c) process causes system crash
d) none of the mentioned

14. If the memory access time is denoted by 'ma' and 'p' is the probability of a page fault (0 <= p <= 1). Then the effective access time for a demand paged memory is _____
a) p x ma + (1-p) x page fault time
b) ma + page fault time
c) (1-p) x ma + p x page fault time
d) none of the mentioned

15. When the page fault rate is low _____
a) the turnaround time increases
b) the effective access time increases
c) the effective access time decreases
d) turnaround time & effective access time increases

16. Locality of reference implies that the page reference being made by a process _____
a) will always be to the page used in the previous page reference
b) is likely to be one of the pages used in the last few page references
c) will always be one of the pages existing in memory
d) will always lead to page faults

1. Which of the following page replacement algorithms suffers from Belady's Anomaly?
a) Optimal replacement
b) LRU
c) FIFO
d) Both optimal replacement and FIFO

2. A process refers to 5 pages, A, B, C, D, E in the order : A, B, C, D, A, B, E, A, B, C, D, E. If the page replacement algorithm is FIFO, the number of page transfers with an empty internal store of 3 frames is?
a) 8
b) 10

c) 9

d) 7

3. A process refers to 5 pages, A, B, C, D, E in the order : A, B, C, D, A, B, E, A, B, C, D, E. If the page replacement algorithm is FIFO, the number of page frames is increased to 4, then the number of page transfers _____

a) decreases

b) increases

c) remains the same

d) none of the mentioned

4. A memory page containing a heavily used variable that was initialized very early and is in constant use is removed, then the page replacement algorithm used is _____

a) LRU

b) LFU

c) FIFO

d) None of the mentioned

5. A virtual memory system uses First In First Out (FIFO) page replacement policy and allocates a fixed number of frames to a process. Consider the following statements.

P : Increasing the number of page frames allocated to a process sometimes increases the page fault rate

Q : Some programs do not exhibit locality of reference

Which of the following is TRUE?

a) Both P and Q are true, and Q is the reason for P

b) Both P and Q are true, but Q is not the reason for P

c) P is false but Q is true

d) Both P and Q are false

6. Users _____ that their processes are running on a paged system.

a) are aware

b) are unaware

c) may unaware

d) none of the mentioned

7. If no frames are free, _____ page transfer(s) is/are required.

a) one

b) two

c) three

d) four

8. When a page is selected for replacement, and its modify bit is set _____

a) the page is clean

b) the page has been modified since it was read in from the disk

c) the page is dirty

d) the page has been modified since it was read in from the disk & page is dirty

9. The aim of creating page replacement algorithms is to _____

a) replace pages faster

b) increase the page fault rate

c) decrease the page fault rate

d) to allocate multiple pages to processes

10. A FIFO replacement algorithm associates with each page the _____

a) time it was brought into memory

b) size of the page in memory

c) page after and before it

d) all of the mentioned

11. What is the Optimal page – replacement algorithm?

a) Replace the page that has not been used for a long time

b) Replace the page that has been used for a long time

c) Replace the page that will not be used for a long time

d) None of the mentioned

12. Optimal page – replacement algorithm is difficult to implement, because _____

a) it requires a lot of information

b) it requires future knowledge of the reference string

c) it is too complex

d) it is extremely expensive

13. LRU page – replacement algorithm associates with each page the _____

a) time it was brought into memory

b) the time of that page's last use

c) page after and before it

d) all of the mentioned

14. For 3 page frames, the following is the reference string:

7 0 1 2 0 3 0 4 2 3 0 3 2 1 2 0 1 7 0 1

How many page faults does the LRU page replacement algorithm produce?

a) 10

b) 15

c) 11

d) 12

15. What are the two methods of the LRU page replacement policy that can be implemented in hardware?

a) Counters

b) RAM & Registers

c) Stack & Counters

d) Registers

1. When using counters to implement LRU, we replace the page with the _____

a) smallest time value

b) largest time value

c) greatest size

d) none of the mentioned

2. In the stack implementation of the LRU algorithm, a stack can be maintained in a manner _____

a) whenever a page is used, it is removed from the stack and put on bottom

b) the bottom of the stack is the LRU page

c) the top of the stack contains the LRU page and all new pages are added to the top

d) none of the mentioned

3. There is a set of page replacement algorithms that can never exhibit Belady's Anomaly, called _____

a) queue algorithms

b) stack algorithms

c) string algorithms

d) none of the mentioned

4. Applying the LRU page replacement to the following reference string.

1 2 4 5 2 1 2 4

The main memory can accommodate 3 pages and it already has pages 1 and 2. Page 1 came in before page 2.

How many page faults will occur?

a) 2

b) 3

c) 4

d) 5

5. Increasing the RAM of a computer typically improves performance because _____

a) Virtual memory increases

b) Larger RAMs are faster

c) Fewer page faults occur

d) None of the mentioned

6. The essential content(s) in each entry of a page table is/are _____

a) Virtual page number

b) Page frame number

c) Both virtual page number and page frame number

d) Access right information

7. The minimum number of page frames that must be allocated to a running process in a virtual memory environment is determined by _____

a) the instruction set architecture

b) page size

c) physical memory size

d) number of processes in memory

8. What is the reason for using the LFU page replacement algorithm?

a) an actively used page should have a large reference count

b) a less used page has more chances to be used again

c) it is extremely efficient and optimal

d) all of the mentioned

9. What is the reason for using the MFU page replacement algorithm?

a) an actively used page should have a large reference count

b) a less used page has more chances to be used again

c) it is extremely efficient and optimal

d) all of the mentioned

1. The minimum number of frames to be allocated to a process is decided by the _____

a) the amount of available physical memory

b) operating System

c) instruction set architecture

d) none of the mentioned

2. When a page fault occurs before an executing instruction is complete if _____

a) the instruction must be restarted

b) the instruction must be ignored

c) the instruction must be completed ignoring the page fault

d) none of the mentioned

3. Consider a machine in which all memory reference instructions have only one memory address, for them we need at least _____ frame(s).

a) one

b) two

c) three

d) none of the mentioned

4. The maximum number of frames per process is defined by _____

a) the amount of available physical memory

b) operating System

c) instruction set architecture

d) none of the mentioned

5. The algorithm in which we split m frames among n processes, to give everyone an equal share, m/n frames is known as _____

a) proportional allocation algorithm

b) equal allocation algorithm

c) split allocation algorithm

d) none of the mentioned

6. The algorithm in which we allocate memory to each process according to its size is known as _____

a) proportional allocation algorithm

b) equal allocation algorithm

c) split allocation algorithm

d) none of the mentioned

7. With either equal or proportional algorithm, a high priority process is treated _____ a low priority process.

a) greater than

b) same as

c) lesser than

d) none of the mentioned

8. _____ replacement allows a process to select a replacement frame from the set of all frames, even if the frame is currently allocated to some other process.

a) Local

b) Universal

c) Global

d) Public

9. _____ replacement allows each process to only select from its own set of allocated frames.

a) Local

b) Universal

c) Global

d) Public

10. One problem with the global replacement algorithm is that _____

a) it is very expensive

b) many frames can be allocated to a process

c) only a few frames can be allocated to a process
d) a process cannot control its own page – fault rate
11. _____ replacement generally results in greater system throughput.
a) Local
b) Global
c) Universal
d) Public

1. A process is thrashing if _____
a) it spends a lot of time executing, rather than paging
b) it spends a lot of time paging than executing
c) it has no memory allocated to it
d) none of the mentioned
2. Thrashing _____ the CPU utilization.
a) increases
b) keeps constant
c) decreases
d) none of the mentioned
3. What is a locality?
a) a set of pages that are actively used together
b) a space in memory
c) an area near a set of processes
d) none of the mentioned
4. When a subroutine is called _____
a) it defines a new locality
b) it is in the same locality from where it was called
c) it does not define a new locality
d) none of the mentioned
5. A program is generally composed of several different localities, which _____ overlap.
a) may
b) must
c) do not
d) must not
6. In the working set model, for:
2 6 1 5 7 7 7 7 5 1 6 2 3 4 1 2 3 4 4 4 3 4 3 4 4 4 1 3 2 3
if DELTA = 10, then the working set at time t1 (….7 5 1) is?
a) {1, 2, 4, 5, 6}
b) {2, 1, 6, 7, 3}
c) {1, 6, 5, 7, 2}
d) {1, 2, 3, 4, 5}
7. The accuracy of the working set depends on the selection of _____
a) working set model
b) working set size
c) memory size
d) number of pages in memory
8. If working set window is too small _____
a) it will not encompass entire locality

b) it may overlap several localities
c) it will cause memory problems
d) none of the mentioned

9. If working set window is too large _____
a) it will not encompass entire locality
b) it may overlap several localities
c) it will cause memory problems
d) none of the mentioned

10. If the sum of the working – set sizes increases, exceeding the total number of available frames _____
a) then the process crashes
b) the memory overflows
c) the system crashes
d) the operating system selects a process to suspend

11. Consider the following page reference string.
1 2 3 4 2 1 5 6 2 1 2 3 7 6 3 2 1 2 3 6
For LRU page replacement algorithm with 4 frames, the number of page faults is?
a) 10
b) 14
c) 8
d) 11

12. Consider the following page reference string.
1 2 3 4 2 1 5 6 2 1 2 3 7 6 3 2 1 2 3 6
For LRU page replacement algorithm with 5 frames, the number of page faults is?
a) 10
b) 14
c) 8
d) 11

13. Consider the following page reference string.
1 2 3 4 2 1 5 6 2 1 2 3 7 6 3 2 1 2 3 6
For FIFO page replacement algorithms with 3 frames, the number of page faults is?
a) 16
b) 15
c) 14
d) 11

14. Consider the following page reference string.
1 2 3 4 2 1 5 6 2 1 2 3 7 6 3 2 1 2 3 6
For FIFO page replacement algorithms with 4 frames, the number of page faults is?
a) 16
b) 15
c) 14
d) 11

15. Consider the following page reference string.
1 2 3 4 2 1 5 6 2 1 2 3 7 6 3 2 1 2 3 6
For Optimal page replacement algorithms with 3 frames, the number of page faults is?
a) 16
b) 15

c) 14
d) 11

DISK MANAGEMENT

1. In _____ information is recorded magnetically on platters.
a) magnetic disks
b) electrical disks
c) assemblies
d) cylinders
2. The heads of the magnetic disk are attached to a _____ that moves all the heads as a unit.
a) spindle
b) disk arm
c) track
d) none of the mentioned
3. The set of tracks that are at one arm position make up a _____
a) magnetic disks
b) electrical disks
c) assemblies
d) cylinders
4. The time taken to move the disk arm to the desired cylinder is called the _____
a) positioning time
b) random access time
c) seek time
d) rotational latency
5. The time taken for the desired sector to rotate to the disk head is called _____
a) positioning time
b) random access time
c) seek time
d) rotational latency
6. When the head damages the magnetic surface, it is known as _____
a) disk crash
b) head crash
c) magnetic damage
d) all of the mentioned
7. A floppy disk is designed to rotate _____ as compared to a hard disk drive.
a) faster
b) slower
c) at the same speed
d) none of the mentioned
8. What is the host controller?
a) controller built at the end of each disk
b) controller at the computer end of the bus
c) all of the mentioned
d) none of the mentioned

9. _____ controller sends the command placed into it, via messages to the _____ controller.
a) host, host
b) disk, disk
c) host, disk
d) disk, host
10. What is the disk bandwidth?
a) the total number of bytes transferred
b) total time between the first request for service and the completion on the last transfer
c) the total number of bytes transferred divided by the total time between the first request for service and the completion on the last transfer
d) none of the mentioned

1. Whenever a process needs I/O to or from a disk it issues a _____
a) system call to the CPU
b) system call to the operating system
c) a special procedure
d) all of the mentioned
2. If a process needs I/O to or from a disk, and if the drive or controller is busy then _____
a) the request will be placed in the queue of pending requests for that drive
b) the request will not be processed and will be ignored completely
c) the request will be not be placed
d) none of the mentioned
3. Consider a disk queue with requests for I/O to blocks on cylinders.
98 183 37 122 14 124 65 67
Considering FCFS (first cum first served) scheduling, the total number of head movements is, if the disk head is initially at 53 is?
a) 600
b) 620
c) 630
d) 640
4. Consider a disk queue with requests for I/O to blocks on cylinders.
98 183 37 122 14 124 65 67
Considering SSTF (shortest seek time first) scheduling, the total number of head movements is, if the disk head is initially at 53 is?
a) 224
b) 236
c) 245
d) 240
5. Random access in magnetic tapes is _____ compared to magnetic disks.
a) fast
b) very fast
c) slow
d) very slow
6. Magnetic tape drives can write data at a speed _____ disk drives.
a) much lesser than

b) comparable to

c) much faster than

d) none of the mentioned

7. On media that use constant linear velocity (CLV), the _____ is uniform.

a) density of bits on the disk

b) density of bits per sector

c) the density of bits per track

d) none of the mentioned

8. SSTF algorithm, like SJF _____ of some requests.

a) may cause starvation

b) will cause starvation

c) does not cause starvation

d) causes aging

9. In the _____ algorithm, the disk arm starts at one end of the disk and moves toward the other end, servicing requests till the other end of the disk. At the other end, the direction is reversed and servicing continues.

a) LOOK

b) SCAN

c) C-SCAN

d) C-LOOK

10. In the _____ algorithm, the disk head moves from one end to the other, servicing requests along the way. When the head reaches the other end, it immediately returns to the beginning of the disk without servicing any requests on the return trip.

a) LOOK

b) SCAN

c) C-SCAN

d) C-LOOK

11. In the _____ algorithm, the disk arm goes as far as the final request in each direction, then reverses direction immediately without going to the end of the disk.

a) LOOK

b) SCAN

c) C-SCAN

d) C-LOOK

1. The process of dividing a disk into sectors that the disk controller can read and write, before a disk can store data is known as _____

a) partitioning

b) swap space creation

c) low-level formatting

d) none of the mentioned

2. The data structure for a sector typically contains _____

a) header

b) data area

c) trailer

d) all of the mentioned

3. The header and trailer of a sector contain information used by the disk controller such as _____ and _____

a) main section & disk identifier

b) error correcting codes (ECC) & sector number

c) sector number & main section

d) disk identifier & sector number

4. The two steps the operating system takes to use a disk to hold its files are _____ and _____

a) partitioning & logical formatting

b) swap space creation & caching

c) caching & logical formatting

d) logical formatting & swap space creation

5. The _____ program initializes all aspects of the system, from CPU registers to device controllers and the contents of main memory, and then starts the operating system.

a) main

b) bootloader

c) bootstrap

d) rom

6. For most computers, the bootstrap is stored in _____

a) RAM

b) ROM

c) Cache

d) Tertiary storage

7. A disk that has a boot partition is called a _____

a) start disk

b) end disk

c) boot disk

d) all of the mentioned

8. Defective sectors on disks are often known as _____

a) good blocks

b) destroyed blocks

c) bad blocks

d) none of the mentioned

9. In SCSI disks used in high end PCs, the controller maintains a list of _____ on the disk. The disk is initialized during _____ which sets aside spare sectors not visible to the operating system.

a) destroyed blocks, high level formatting

b) bad blocks, partitioning

c) bad blocks, low level formatting

d) destroyed blocks, partitioning

10. In SCSI disks used in high end PCs, the controller maintains a list of bad blocks on the disk. The disk is initialized during low-level formatting which sets aside spare sectors not visible to the operating system. The scheme used is known as _____ or _____

a) sector sparing & forwarding

b) forwarding & sector utilization

c) backwarding & forwarding

d) sector utilization & backwarding

11. An unrecoverable error is known as _____

a) hard error

b) tough error
c) soft error
d) none of the mentioned

FILE MANAGEMENT

1. _____ is a unique tag, usually a number identifies the file within the file system.
a) File identifier
b) File name
c) File type
d) None of the mentioned
2. To create a file _____
a) allocate the space in file system
b) make an entry for new file in directory
c) allocate the space in file system & make an entry for new file in directory
d) none of the mentioned
3. By using the specific system call, we can _____
a) open the file
b) read the file
c) write into the file
d) all of the mentioned
4. File type can be represented by _____
a) file name
b) file extension
c) file identifier
d) none of the mentioned
5. Which file is a sequence of bytes organized into blocks understandable by the system's linker?
a) object file
b) source file
c) executable file
d) text file
6. What is the mounting of file system?
a) crating of a filesystem
b) deleting a filesystem
c) attaching portion of the file system into a directory structure
d) removing the portion of the file system into a directory structure
7. Mapping of file is managed by _____
a) file metadata
b) page table
c) virtual memory
d) file system
8. Mapping of network file system protocol to local file system is done by _____
a) network file system
b) local file system
c) volume manager
d) remote mirror

9. Which one of the following explains the sequential file access method?
a) random access according to the given byte number
b) read bytes one at a time, in order
c) read/write sequentially by record
d) read/write randomly by record
10. When will file system fragmentation occur?
a) unused space or single file are not contiguous
b) used space is not contiguous
c) unused space is non-contiguous
d) multiple files are non-contiguous

1. Management of metadata information is done by _____
a) file-organisation module
b) logical file system
c) basic file system
d) application programs
2. A file control block contains the information about _____
a) file ownership
b) file permissions
c) location of file contents
d) all of the mentioned
3. Which table contains the information about each mounted volume?
a) mount table
b) system-wide open-file table
c) per-process open-file table
d) all of the mentioned
4. To create a new file application program calls _____
a) basic file system
b) logical file system
c) file-organisation module
d) none of the mentioned
5. What will happens when a process closes the file?
a) per-process table entry is not removed
b) system wide entry's open count is decremented
c) all of the mentioned
d) none of the mentioned
6. What is raw disk?
a) disk without file system
b) empty disk
c) disk lacking logical file system
d) disk having file system
7. The data structure used for file directory is called _____
a) mount table
b) hash table
c) file table
d) process table

8. In which type of allocation method each file occupy a set of contiguous block on the disk?
a) contiguous allocation
b) dynamic-storage allocation
c) linked allocation
d) indexed allocation
9. If the block of free-space list is free then bit will _____
a) 1
b) 0
c) any of 0 or 1
d) none of the mentioned
10. Which protocol establishes the initial logical connection between a server and a client?
a) transmission control protocol
b) user datagram protocol
c) mount protocol
d) datagram congestion control protocol

1. Data cannot be written to secondary storage unless written within a _____
a) file
b) swap space
c) directory
d) text format
2. File attributes consist of _____
a) name
b) type
c) identifier
d) all of the mentioned
3. The information about all files is kept in _____
a) swap space
b) operating system
c) seperate directory structure
d) none of the mentioned
4. A file is a/an _____ data type.
a) abstract
b) primitive
c) public
d) private
5. The operating system keeps a small table containing information about all open files called _____
a) system table
b) open-file table
c) file table
d) directory table
6. In UNIX, what will the open system call return?
a) pointer to the entry in the open file table
b) pointer to the entry in the system wide table
c) a file to the process calling it
d) none of the mentioned

7. System wide table in UNIX contains process independent information such as
_____
a) location of file on disk
b) access dates
c) file size
d) all of the mentioned
8. The open file table has a/an _____ associated with each file.
a) file content
b) file permission
c) open count
d) close count
9. Which of the following are the two parts of the file name?
a) name & identifier
b) identifier & type
c) extension & name
d) type & extension

1. The UNIX sytem uses a/an _____ stored at the beginning of a some files to indicate roughly the type of file.
a) identifier
b) extension
c) virtual number
d) magic number
2. The larger the block size, the _____ the internal fragmentation.
a) greater
b) lesser
c) same
d) none of the mentioned
3. In the sequential access method, information in the file is processed _____
a) one disk after the other, record access doesnt matter
b) one record after the other
c) one text document after the other
d) none of the mentioned
4. Sequential access method _____ on random access devices.
a) works well
b) doesnt work well
c) maybe works well and doesnt work well
d) none of the mentioned
5. The direct access method is based on a _____ model of a file, as _____ allow random access to any file block.
a) magnetic tape, magnetic tapes
b) tape, tapes
c) disk, disks
d) all of the mentioned
6. For a direct access file _____
a) there are restrictions on the order of reading and writing
b) there are no restrictions on the order of reading and writing

c) access is restricted permission wise

d) access is not restricted permission wise

7. A relative block number is an index relative to _____

a) the beginning of the file

b) the end of the file

c) the last written position in file

d) none of the mentioned

8. The index contains _____

a) names of all contents of file

b) pointers to each page

c) pointers to the various blocks

d) all of the mentioned

9. For large files, when the index itself becomes too large to be kept in memory?

a) index is called

b) an index is created for the index file

c) secondary index files are created

d) all of the mentioned

1. To organise file systems on disk _____

a) they are split into one or more partitions

b) information about files is added to each partition

c) they are made on different storage spaces

d) all of the mentioned

2. The directory can be viewed as a _____ that translates file names into their directory entries.

a) symbol table

b) partition

c) swap space

d) cache

3. What will happen in the single level directory?

a) All files are contained in different directories all at the same level

b) All files are contained in the same directory

c) Depends on the operating system

d) None of the mentioned

4. What will happen in the single level directory?

a) all directories must have unique names

b) all files must have unique names

c) all files must have unique owners

d) all of the mentioned

5. What will happen in the two level directory structure?

a) each user has his/her own user file directory

b) the system doesn't its own master file directory

c) all of the mentioned

d) none of the mentioned

6. When a user job starts in a two level directory system, or a user logs in _____

a) the users user file directory is searched

b) the system's master file directory is not searched

c) the master file directory is indexed by user name or account number, and each entry points to the UFD for that user

d) all of the mentioned

7. When a user refers to a particular file?

a) system MFD is searched

b) his own UFD is not searched

c) both MFD and UFD are searched

d) every directory is searched

8. What is the disadvantage of the two level directory structure?

a) it does not solve the name collision problem

b) it solves the name collision problem

c) it does not isolate users from one another

d) it isolates users from one another

9. In the tree structured directories _____

a) the tree has the stem directory

b) the tree has the leaf directory

c) the tree has the root directory

d) all of the mentioned

10. The current directory contains, most of the files that are _____

a) of current interest to the user

b) stored currently in the system

c) not used in the system

d) not of current interest to the system

11. Which of the following are the types of Path names?

a) absolute & relative

b) local & global

c) global & relative

d) relative & local

1. The three major methods of allocating disk space that are in wide use are _____

a) contiguous

b) linked

c) indexed

d) all of the mentioned

2. In contiguous allocation _____

a) each file must occupy a set of contiguous blocks on the disk

b) each file is a linked list of disk blocks

c) all the pointers to scattered blocks are placed together in one location

d) none of the mentioned

3. In linked allocation _____

a) each file must occupy a set of contiguous blocks on the disk

b) each file is a linked list of disk blocks

c) all the pointers to scattered blocks are placed together in one location

d) none of the mentioned

4. In indexed allocation _____

a) each file must occupy a set of contiguous blocks on the disk

b) each file is a linked list of disk blocks

c) all the pointers to scattered blocks are placed together in one location

d) none of the mentioned

5. On systems where there are multiple operating system, the decision to load a particular one is done by _____

a) boot loader

b) bootstrap

c) process control block

d) file control block

6. The VFS (virtual file system) activates file system specific operations to handle local requests according to their _____

a) size

b) commands

c) timings

d) file system types

7. What is the real disadvantage of a linear list of directory entries?

a) size of the linear list in memory

b) linear search to find a file

c) it is not reliable

d) all of the mentioned

8. Contiguous allocation of a file is defined by _____

a) disk address of the first block & length

b) length & size of the block

c) size of the block

d) total size of the file

9. One difficulty of contiguous allocation is _____

a) finding space for a new file

b) inefficient

c) costly

d) time taking

10. _____ and _____ are the most common strategies used to select a free hole from the set of available holes.

a) First fit, Best fit

b) Worst fit, First fit

c) Best fit, Worst fit

d) None of the mentioned

11. The first fit and best fit algorithms suffer from _____

a) internal fragmentation

b) external fragmentation

c) starvation

d) all of the mentioned

12. To solve the problem of external fragmentation _____ needs to be done periodically.

a) compaction

b) check

c) formatting

d) replacing memory

13. If too little space is allocated to a file _____

a) the file will not work

b) there will not be any space for the data, as the FCB takes it all
c) the file cannot be extended
d) the file cannot be opened

1. A device driver can be thought of like a translator. Its input consists of _____ commands and output consists of _____ instructions.
a) high level, low level
b) low level, high level
c) complex, simple
d) low level, complex

2. The file organization module knows about _____
a) files
b) logical blocks of files
c) physical blocks of files
d) all of the mentioned

3. Metadata includes _____
a) all of the file system structure
b) contents of files
c) both file system structure and contents of files
d) none of the mentioned

4. For each file there exists a _____ that contains information about the file, including ownership, permissions and location of the file contents.
a) metadata
b) file control block
c) process control block
d) all of the mentioned

5. For processes to request access to file contents, they need _____
a) to run a seperate program
b) special interrupts
c) to implement the open and close system calls
d) none of the mentioned

6. During compaction time, other normal system operations _____ be permitted.
a) can
b) cannot
c) is
d) none of the mentioned

7. When in contiguous allocation the space cannot be extended easily?
a) the contents of the file have to be copied to a new space, a larger hole
b) the file gets destroyed
c) the file will get formatted and lost all its data
d) none of the mentioned

8. In the linked allocation, the directory contains a pointer to which block?
I. first block
II. last block
a) I only
b) II only

c) Both I and II

d) Neither I nor II

9. There is no _____ with linked allocation.

a) internal fragmentation

b) external fragmentation

c) starvation

d) all of the mentioned

10. What is the major disadvantage with a linked allocation?

a) internal fragmentation

b) external fragmentation

c) there is no sequential access

d) there is only sequential access

11. What if a pointer is lost or damaged in a linked allocation?

a) the entire file could get damaged

b) only a part of the file would be affected

c) there would not be any problems

d) none of the mentioned

12. FAT stands for _____

a) File Attribute Transport

b) File Allocation Table

c) Fork At Time

d) None of the mentioned

13. By using FAT, random access time is _____

a) the same

b) increased

c) decreased

d) not affected

1. A better way of contiguous allocation to extend the file size is _____

a) adding an extent (another chunk of contiguous space)

b) adding an index table to the first contiguous block

c) adding pointers into the first contiguous block

d) none of the mentioned

2. If the extents are too large, then what is the problem that comes in?

a) internal fragmentation

b) external fragmentation

c) starvation

d) all of the mentioned

3. The FAT is used much as a _____

a) stack

b) linked list

c) data

d) pointer

4. A section of disk at the beginning of each partition is set aside to contain the table in _____

a) fat

b) linked allocation

c) hashed allocation

d) indexed allocation

5. Contiguous allocation has two problems _____ and _____ that linked allocation solves.

a) external – fragmentation & size – declaration

b) internal – fragmentation & external – fragmentation

c) size – declaration & internal – fragmentation

d) memory – allocation & size – declaration

6. Each _____ has its own index block.

a) partition

b) address

c) file

d) all of the mentioned

7. Indexed allocation _____ direct access.

a) supports

b) does not support

c) is not related to

d) none of the mentioned

8. The pointer overhead of indexed allocation is generally _____ the pointer overhead of linked allocation.

a) less than

b) equal to

c) greater than

d) keeps varying with

9. For any type of access, contiguous allocation requires _____ access to get a disk block.

a) only one

b) at least two

c) exactly two

d) none of the mentioned