Processes

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
View Answer

2. To access the services of operating system, the interface is provided by the
_____
a) System calls
b) API
c) Library
d) Assembly instructions
View Answer

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
View Answer

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
View Answer

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
View Answer

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
View Answer
9. Which one of the following is not a real time operating system?
a) VxWorks
b) QNX
c) RTLinux
d) Palm OS
View Answer
10. The OS X has _____
a) monolithic kernel
b) hybrid kernel
c) microkernel
d) monolithic kernel with modules

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
View Answer
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
View Answer
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
View Answer
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
View Answer
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
View Answer
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

1. A Process Control Block(PCB) does not contain which of the following?
a) Code
b) Stack
c) Bootstrap program
d) Data
View Answer
2. The number of processes completed per unit time is known as _____
a) Output
b) Throughput
c) Efficiency
d) Capacity
View Answer
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
View Answer
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
View Answer
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
View Answer
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
View Answer
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

1. Which of the following do not belong to queues for processes?
a) Job Queue
b) PCB queue
c) Device Queue
d) Ready Queue
View Answer
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
View Answer
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
View Answer
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
View Answer
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
View Answer
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
View Answer
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

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
View Answer
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
View Answer
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
View Answer
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
View Answer
8. Process synchronization can be done on _____
a) hardware level
b) software level
c) both hardware and software level
d) none of the mentioned
View Answer

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
View Answer

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

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
View Answer

2. A parent process calling _____ system call will be suspended until children processes terminate.
a) wait
b) fork
c) exit
d) exec
View Answer

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
View Answer

5. In UNIX, each process is identified by its _____
a) Process Control Block
b) Device Queue
c) Process Identifier
d) None of the mentioned
View Answer

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
View Answer
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
View Answer
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

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
View Answer
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
View Answer
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
View Answer

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
View Answer

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
View Answer

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
View Answer

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
View Answer

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

Process Synchronization

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

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

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
View Answer

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
View Answer

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
View Answer

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()
View Answer

8. The signal operation of the semaphore basically works on the basic _____ system call.
a) continue()
b) wakeup()
c) getup()
d) start()
View Answer

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
View Answer

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
View Answer

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
View Answer

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
View Answer

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
View Answer

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
View Answer
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
View Answer
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
View Answer
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
View Answer

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
View Answer

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
View Answer

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
View Answer
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