Question -01
The process control block is: select one:
a. Data structure
b. Process type variable
c. A secondary storage section
d. A block in memory

Answer:
A Data structure.

Explanation :

PCB is a data-structure which is Present in the OS kernel, it contains the information needed to manage the process scheduling**.**

Question -02
The number of processes completed per unit time is known as _____.
(A) output
(B) throughput
(C) efficiency
(D) capacity

Answer:
(B) throughput

Explanation :

The number of processes completed per unit time is known as throughput.

Question -03

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.

Answer

(d) the current activity of the process

Explanation: The state of a process is defined by the current activity of the process. A process state changes when the process executes. The process states are as New, Ready, Running, Wait, Terminated.

Question -04

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

Answer

(c) The frequency of their execution

Explanation : The primary distinction between the short-term scheduler and the long-term scheduler is the frequency of their execution. The short-term scheduler executes frequently while the long-term scheduler executes much less frequently.

Question 05

What is a long-term scheduler ?

a. It selects which process has to be brought into the ready queue

b. It selects which process to remove from memory by swapping

c. None of the mentioned

d. It selects which process has to be executed next and allocates cpu

Answer

a)It selects which process has to be brought into the ready queue

Explanation:

Long Term Scheduler. It is also called a job scheduler. A long-term scheduler determines which programs are admitted to the system for processing. It selects processes from the queue and loads them into memory for execution.

Question 06

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

Answer B. translation lookaside buffer

Explanation :

Translation look-aside buffer

In a process context switch, the state of the first process must be saved somehow, so that, when the scheduler gets back to the execution of the first process, it can restore this state and continue.The state of the process includes all the registers that the process may be using, especially the program counter, plus any other operating system specific data that may be necessary.A Translation look-aside buffer (TLB) is a CPU cache that memory management hardware uses to improve virtual address translation speed. A TLB has a fixed number of slots that contain page table entries, which map virtual addresses to

physical addresses. On a context switch, some TLB entries can become invalid, since the virtual-to-physical mapping is different. The simplest strategy to deal with this is to completely flush the TLB.

Question 07

Which one of the following is a synchronization tool?

A. thread
B. pipe
C. semaphore
D. socketstion

Answer C. semaphore
Explanation
Semaphore is a synchronization tool. Semaphore is a mechanism which synchronizes or controls access of threads on critical resources. There are two types of semaphores i) Binary Semaphore ii) Counting Semaphore.

Question -08

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

a. wait
b. fork
c. exit
d. exec

Answer : (a) wait
Explanation: A parent process calling wait system call will be suspended until children processes terminate. A parameter is passed to wait system call which will obtain exit status of child as well as wait system call returns PID of terminated process

Question -09
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

Answer a)
a)be a duplicate of the parent process

Question 10
Consider the following three processes in the FCFS.What is the average waiting time?

Process ID.	Brust-time.	Arrival-time
P1	3	3
P2	6	6
P3	9	9

a)2
b)3
c)4
d)5

Answer: b)3

Explanation:

TA Time = CT - AT

Waiting Time = TA - BT

Process ID. Brust-time.	Arrival-time	Completion-Time (CT)	Turnaround-Time (TA)	Waiting-Time (WT)	
P1	3	3	3	3	0
P2	6	6	9	8	2
P3	9	9	18	16	7

Average waiting time = (0 + 2 + 7) / 3 = 3

Question 11

Which one of the following is the deadlock avoidance algorithm?

A. banker's algorithm

B. round-robin algorithm

C. elevator algorithm

D. karn's algorithm

Answer

A. banker’s algorithm

Explanation:Banker's algorithm is a deadlock avoidance and resource allocation algorithm. This algorithm was developed by Edger Dijkstra. It is also called a detection algorithm.

Question 12:

Which of the following component does not belong to PCB (Process Control Block)?

a)CPU registers
b)CPU scheduling information
c)Operating System information
d)Accounting Information

Answer : d) Accounting Information
Explanation : The operating system information is not the component of the PCB, so option (d) is the correct answer.

Question 13:
Which of the following methods is used to improve the main memory utilization?
a) Swapping
b) Operating system
c) Memory stack
d) None of these.
Answer a)Swapping
Explanation:
Swapping is a technique in which the process is removed from the main memory and stored in secondary memory. It is used to improve the main memory util

Question 14

SSTF stands for _____.

a)Shortest Signal Time First
b)Shortest Seek Time First
c)System Seek Time First
d)System Shortest Time First

Ans b)Shortest Seek Time First

Explanation:

SSTF stands for Shortest-Seek-Time-First. In the SSTF algorithm, that request is executed first, whose seek time is the shortest.

Question 15

Which of the following scheduling reduces process flow time?

a)FCFS
b)LIFO
c)SJF
d)All of the these

Answer:c)SJF
Explanation :
Shortest job first scheduling is non-preemptive scheduling. In this scheduling algorithm, the process which takes the least time to complete executes that process first.

Question 16

Which of the following page replacement algorithms suffers from Belady's anomaly?

a) FIFO
b) LRU
c) Optimal Page Replacement
d) Both LRU and FIFO

Answer: A) FIFO

Explanation:Bélády's anomaly is the name given to the phenomenon where increasing the number of page frames results in an increase in the number of page faults for a given memory access pattern.

Question: 17

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)Fewer segmentation faults occur

Answer c)Fewer page faults occur

Explanation

If we increase the size of RAM-main memory, then more pages can be accommodated resulting in fewer page faults. Hence, answer C is the best answer.

Question 18:

A CPU generates 32-bit virtual addresses. The page size is 4 KB. The processor has a translation look-aside buffer (TLB) which can hold a total of 128 page table entries and is 4-way set associative. The minimum size of the TLB tag is:

a) 11 bits
b) 13 bits
c) 15 bits
d) 20 bits

Answer : c)15 bits
Explanation:
The page size is 4 KB. So, offset bits are 12 bits.
So, the remaining bits of virtual address, 32−12=20 bits, will be used for indexing.
Number of sets =128/4=32(4-way set)⟹5 bits.
So, tag bits =20−5=15 bits.
Correct option C.

Question 19:
Page fault occurs when

a)When a requested page is in memory

b)When a requested page is not in memory

c)When a page is corrupted

d)When an exception is thrown

Answer: b)When a requested page is not in memory

Question 20:

A disk has 200 tracks (numbered 0 through 199). At a given time, it was servicing the request of reading data from track 120, and at the previous request, service was for track 90. The pending requests (in order of their arrival) are for track numbers. 30 70 115 130 110 80 20 25. How many times will the head change its direction for the disk scheduling policies SSTF(Shortest Seek Time First) and FCFS (First Come Fist Serve)?

a)2 and 3

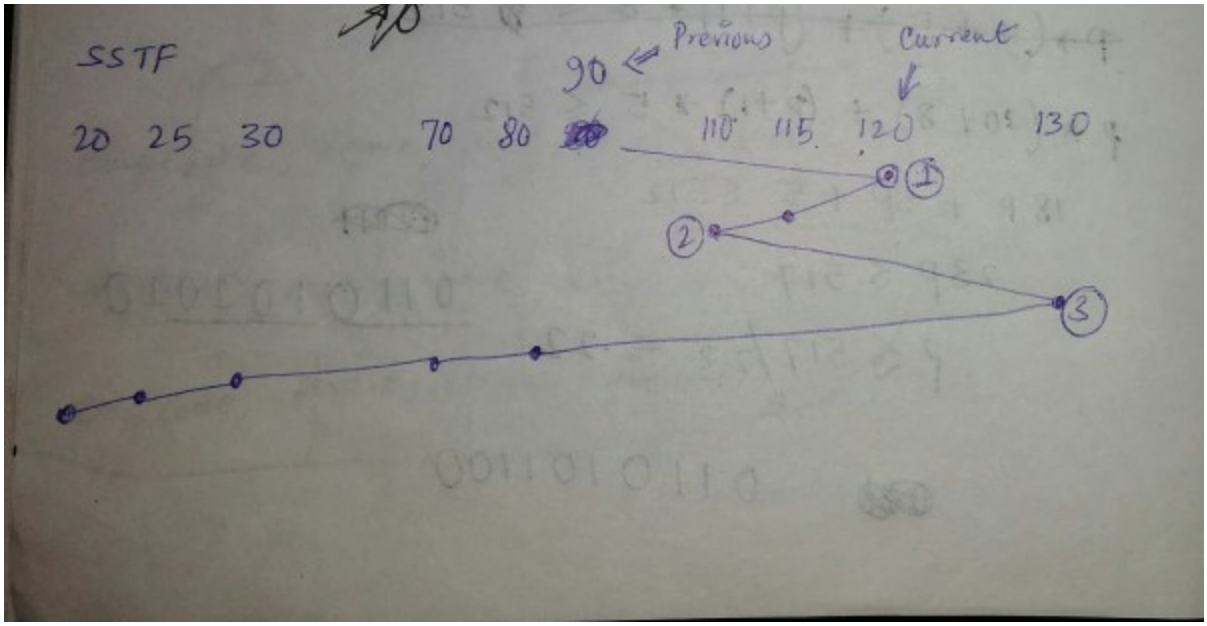
b) 3 and 3

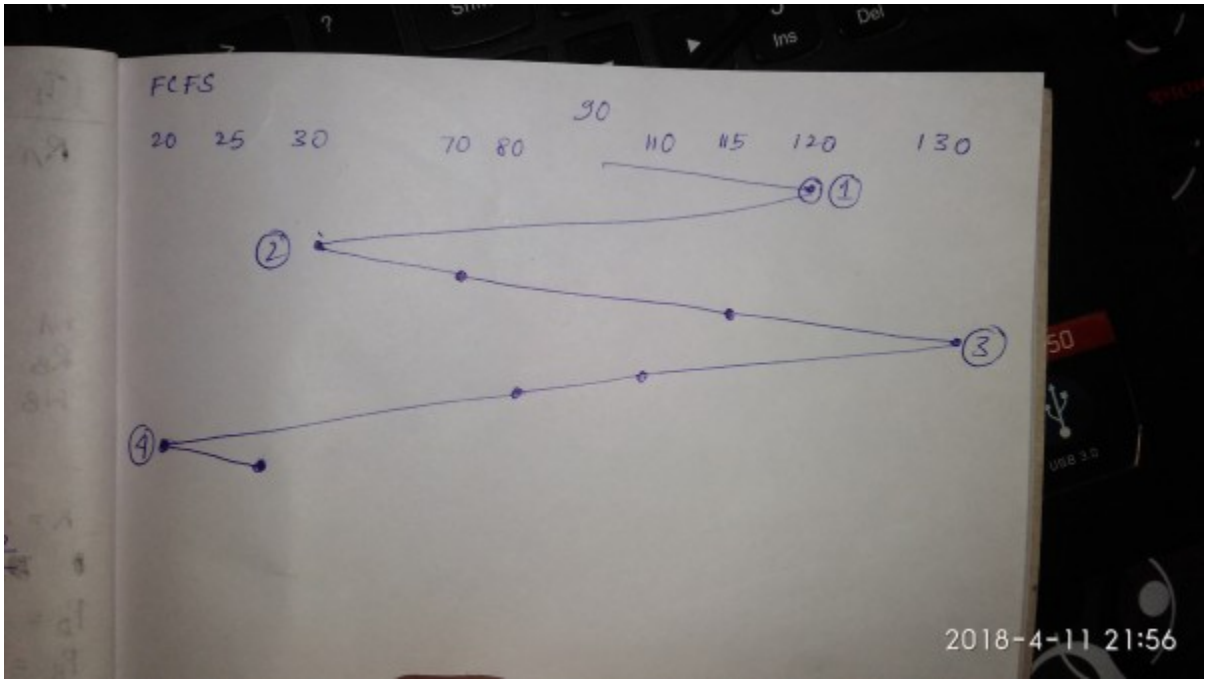
c) 3 and 4

d)4 and 4

An**swer :** c) 3 and 4

Explanation:





SSTF:

(90) 120 115 110 130 80 70 30 25 20

(90) 120 115 110 130 80 70 30 25 20

Direction changes at

120,110,130

120,110,130

FCFS:

(90) 120 30 70 115 130 110 80 20 25

(90) 120 30 70 115 130 110 80 20 25

direction changes at

120,30,130,20

Question 21:
In a virtual memory system, the size of the virtual address is 32-bit, size of the physical address is 30-bit, page size is 4 Kbyte and size of each page table entry is 32-bit. The main memory is byte addressable. Which one of the following is the maximum number of bits that can be used for storing protection and other information in each page table entry?
a)2
b)10
c)12
d) 14
Answer: d) 14
Explanation :
Page table entry must contain bits for representing frames and other bits for storing information like dirty bit,reference bit etc
No. of frames (no. of possible pages) = Physical memory size/ Page size = 230/212= 218
18+x=32 (PT entry size=32 bit)
x=14 bits

Question 22:
Which of the following scheduling algorithms is non-preemptive?
a)Round Robin
b) First-In First-Out
c) Multilevel Queue Scheduling
d) Multilevel Queue Scheduling with Feedback
Answer b) First-In First-Out

Question 23
The maximum number of processes that can be in Ready state for a computer system with n CPUs is?
a)n
b) n^2

c) 2n
d) Independent of n

Answer D) independent of n
Explanation: The number of processes that can be in READY state depends on the Ready Queue size and is independent of the number of CPUs.

Question 24
Which of the following is FALSE about SJF (Shortest Job First Scheduling)?
S1: It causes minimum average waiting time
S2: It can cause starvation
a)Only S1
b)Only S2
c)Both S1 and S2
d)Neither S1 nor S2

Answer: (D) Neither S1 nor S2

Explanation:

1. Both SJF and Shortest Remaining time first algorithms may cause starvation. Consider a situation when a long process is there in the ready queue and shorter processes keep coming.
2. SJF is optimal in terms of average waiting time for a given set of processes, but the problem with SJF is how to know/predict the time of the next job.

Question 26
Consider the following C code for process P1 and P2. a=4, b=0, c=0 (initialization)P1 P2if (a < 0) b = 10;c = b-a; a = -3;elsec = b+a;If the processes P1 and P2 executed concurrently (shared variables a, b and c), which of the following cannot be the value of 'c' after both processes complete?
a)4
b)7
c)10
d)13

Answer: c)10
Explanation:P1 : 1, 3, 4 -> c = 0+4 =4 {hence option a}
P2 : i, ii and P1 : 1, 2 -> c = 10-(-3) = 13 {hence option d}
P1 : 1 , P2 : i, ii and P1 : 3, 4 -> c= 10+(-3) = 7 { hence option b}
So 10 cannot be c value

Question 27
CPU scheduling takes place when

a)Process switches from running to waiting state
b)Process switches from running state to ready state
c) Process switches from waiting state to ready state
d) All of these

Answer :b)Process switches from running state to ready state
Explanation :

Question 28

Assume every process requires 3 seconds of service time in a system with a single processor. If new processes are arriving at the rate of 10 processes per minute, then estimate the fraction of time the CPU is busy in the system?

a)20%

b)30%

c)50%

d)60%

Answer: c)50%

Explanation:

10 processes -> 1 min

1 process-> 1/10 min = 6 sec (Arrival rate)

Each process -> 3 sec service time 3/6 * 100 = 50% of the time CPU is busy.

Question 29

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.

```
Method Used by P1
while (S1 == S2) ;
Critica1 Section
S1 = S2;

Method Used by P2
while (S1 != S2) ;
Critica1 Section
S2 = not (S1);
```

Which one of the following statements describes the properties achieved?

Answer is (A).

Explanation: In this mutual exclusion is satisfied,only one process can access the critical section at particular time but here progress will not be satisfied because suppose when S1=1 and S2=0 and process P1 is not interested to enter into the critical section but P2 wants to enter the critical section. P2 is not able to enter the critical section in this as only when P1 finishes execution, then only P2 can enter (then only S1=S2 condition be satisfied).

Progress will not be satisfied when any process which is not interested to enter into the critical section will not allow other interested process to enter into the critical section. When P1 wants to enter the

critical section it might need to wait till P2 enters and leaves the critical section (or vice versa) which might never happen and hence the progress condition is violated.

Question 30

Consider the virtual page reference string

1, 2, 3, 2, 4, 1, 3, 2, 4, 1
on a demand paged virtual memory system running on a computer system that has main memory size of 3 page frames which are initially empty. Let LRU, FIFO and OPTIMAL denote the number of page faults under the corresponding page replacement policy. Then

a)OPTIMAL<LRU<FIFO
b) OPTIMAL<FIFO<LRU
c) OPTIMAL=LRU
d) OPTIMAL=FIFO
Answer is .b) OPTIMAL<FIFO<LRU

Explanation: Page fault for LRU =9, FIFO =6, OPTIMAL =5