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
View Answer

Answer: a

Consider a set of 5 processes whose arrival time. CPU time needed and the priority are given below

Process Priority	Arrival Time (in ms)	CPU Time Needed (in ms)	Priority
P1	0	10	5
P2	0	5	2
P3	2	3	1
P4	5	20	4
P5	10	2	3

smaller the number, higher the priority.

If the CPU scheduling policy FCFS, the average waiting time will be

A.12.8 ms

B.8 ms

C.6 ms

D.none of these

Option: A

Explanation :

According to FCFS process solve are p1 p2 p3 p4 p5 so
for p1 waiting time =0 process time=10 then
for p2 waiting time = (process time of p1-arrival time of p2)=10-0=10 then
for p3 waiting time = (pr. time of (p1+p2)-arrival time of p3)=(10+5)-2=13 and
same for p4 waiting time=18-5=13
same for p5 waiting time=38-10=28
So total average waiting time=(0+10+13+13+28)/5=12.8
So answer is 'A'.
0 + 10 + (15- 2) + (18 5) + (38- 10) divided by 5, i.e. 12.8 ms.

Note : Here we will not see priority, we only see who comes first. And here both p1 andp2 came simultaneously and so we take p1 first and it gives answer which matches in option.

Consider a set of 5 processes whose arrival time. CPU time needed and the priority are given below

Process Priority	Arrival Time (in ms)	CPU Time Needed (in ms)	Priority
P1	0	10	5
P2	0	5	2
P3	2	3	1
P4	5	20	4
P5	10	2	3

smaller the number, higher the priority.

If the CPU scheduling policy is SJF, the average waiting time (without pre-emption) will be

A.16 ms

B.12.8

C.6.8 ms

D.none of these

Option: C

Explanation :

8 + 0 + 3 + 15 + 8 divided by 5, i.e. 6.8 ms.

Consider a set of 5 processes whose arrival time. CPU time needed and the priority are given below

Process Priority	Arrival Time (in ms)	CPU Time Needed (in ms)	Priority
P1	0	10	5
P2	0	5	2
P3	2	3	1
P4	5	20	4
P5	10	2	3

smaller the number, higher the priority.

If the CPU scheduling policy is SJF with pre-emption, the average waiting time will be

A. 8 ms

B. 14 ms

C. 6 ms

D. none of these

Option: C

Explanation :

Scheduling order will be

P2 , P3 , P1 , P5 , P1, P4
Waiting time of processes will be
P2 = 0
P3= 5-2=3
P1=10+2=12
P5=0
P4= 15
Average waiting time will be = (0+3+12+0+15)/5= 30/5=6ms

Consider a set of 5 processes whose arrival time. CPU time needed and the priority are given below

Process Priority	Arrival Time (in ms)	CPU Time Needed (in ms)	Priority
P1	0	10	5
P2	0	5	2
P3	2	3	1
P4	5	20	4
P5	10	2	3

smaller the number, higher the priority.

If the CPU scheduling policy is priority scheduling without pre-emption, the average waiting time will be

A.12.8 ms

B.11.8 ms

C.10.8 ms

D.none of these

Option: C

Explanation :

30 + 0 + 3 + 3 + 18 divided by 5, i.e. 10.8 ms.

Consider a set of 5 processes whose arrival time. CPU time needed and the priority are given below

Process Priority	Arrival Time (in ms)	CPU Time Needed (in ms)	Priority
P1	0	10	5
P2	0	5	2
P3	2	3	1
P4	5	20	4
P5	10	2	3

smaller the number, higher the priority.

If the CPU scheduling policy is priority sche duling with pre-emption, the average waiting time will be

A.19 ms

B.7.6 ms

C.6.8 ms

D.none of these

Option: B

Explanation :

Here the process which will start at the initial millisecond will be P2 as it has more priority that P1.

ms	**Process**
0 to 2	P2 (P2 completed 2 ms here)
2 to 5	P3 (No wait for P3)
5 to 8	P2 (P2 had to wait 3 ms to get executed)
8 to 10	P4 (P4 had to wait 3 ms to get started)
10 to 12	P5 (No wait for P5)
12 to 30	P4 (P4 had to wait 2 ms to complete its remaining)
30 to 40	P1 (Was waiting for 30 ms)

So, waiting time---- P1 -30 P2 -3 P3 -0 P4 -5 P5 -0

Average---- (30+3+0+5+0)/5= 7.6 ms

If a disk has a seek time of 20 ms, rotates 20 revolutions per second, has 100 words per block, and each track has capacity of 300 words. Then the total time required to access one block is

A.25

B.30

C.40

D.60

Option: D

Explanation :

Time taken to access one block = seek time + rotational delay + block transfer time
Seek time = 20 ms (given)
Rotational delay = on an average taken to be the time to rotate by half = 1/2 X time for 1 rotation = 1/2 X 1/20 seconds = 1/40 s = 25 ms
Block Transfer time = block size / transfer rate = 100 / transfer rate
Now, transfer rate = Track capacity / rotation rate = 300 / (1/ 20) = 6000 word per sec = 6 word per ms
Block Transfer time = block size / transfer rate = 100 / 6 ~ 16.67 ms per block**Time taken to access one block = seek time + rotational delay + block transfer time= 20 + 25 + 16.67 = 61.67 ms**

Disk requests are received by a disk drive for cylinders 5, 25, 18, 3, 39, 8 and 35 in that order. A seek takes 5 m sec per cylinder moved. How much seek time is needed to serve these requests for a Shortest Seek First (SSF) algorithm ? Assume that the arm is at cylinder 20 when the last of these requests is made with none of the requests yet served

A.125 msec

B.295msec

C.575 msec

D.750 msec

Option: B

Explanation :

Shortest Seek Time First - minimizes arm movement

Order to be followed is - (20) , 18,25,35,39, 8,5,3

Seek = 2+5+7+10+4+31+3+2 = 59 cylinders , 295 ms

Disk requests come to a disk driver for cylinders 10, 22, 20, 2, 40, 6 and 38, in that order at a time when the disk drive is reading from cylinder 20. The seek time is 6 ms per cylinder.

The total seek time, if the disk arm scheduling algorithm is first-come-first-served is

A.360 ms

B.876 ms

C.850 ms

D.900 ms

Option: B

Explanation :

According to FCFS order serverd will be (20),10, 22, 20, 2, 40, 6 and 38

Seek time = 10+12+2+18+38+34+32 = 146

The disk drive has to traverse totally 146 cylinders (verify). So, seek time is 6 x 146 = 876 ms.

Determine the number of page faults when references to pages occur in the following order : 1, 2, 4, 5, 2, 1, 2, 4. Assume that the main memory can accommodate 3 pages and the main memory already has the pages 1 and 2, with page 1 having been brought earlier than page 2. (LRU algorithm is used)

A.3

B.5

C.4

D.none of these

Option: C

In a paged memory, the page hit ratio is 0.35. The time 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

Option: C

Explanation :

0.35 x 10 + (1 - 0.35) x 100 = 68.5 ns

If there are 32 segments, each of size 1 K byte, then the logical address should have

A.13 bits

B.14 bits

C.15 bits

D.16 bits

Option: C

Explanation :

Th specify a particular segment, 5 bits are required (since 2^5 = 32). . Having selected a page, to select a particular byte one needs 10 bits (since 2^{10} = 1 k byte). So, totally 5 + 10 =15 bits are needed.

Consider a computer with 8 Mbytes of main memory and a 128 K 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.None of these

Option: C

Consider the following heap :
JOB1-50 FREE-150 JOB2-300 FREE-350 JOB3-600
The sequence of requests for blocks of sizes 300, 25, 125, 50 can be satisfied if we use

A.either first fit or best fit policy

B.first fit, but not best fit

C.best fit, but not first fit

D.none of these

Option: B

Consider following page trace :

4,3,2, 1,4,3,5,4,3,2, 1,5

Number of page faults that would occur if FIFO page replacement algorithm is used with Number of frames for the Job M=3, will be

A.8

B.9

C.10

D.12

Option: B

Explanation :

When M-3

T	1	2	3	4	5	6	7	8	9	10	11	12
Page Sequence	4	3	2	1	4	3	5	4	3	2	1	5
Memory Frame 1st	4	4	4	1	1	1	5	5	5	5	5	5
2nd		3	3	3	4	4	4	4	4	4	1	1
3rd			2	2	2	3	3	3	3	2	2	2
Page fault	y	y	y	y	y	y	y	n	n	y	y	n

Total Page Fault = 9

Consider following page trace :
4,3,2, 1,4,3,5,4,3,2, 1,5
Percentage of page faults that would occur if FIFO page replacement algorithm is used with

Number offrames for the Job M = 4, will be

A.8

B.9

C.10

D.12

Option: C

Explanation :

When m=4

T	1	2	3	4	5	6	7	8	9	10	11	12
Page Sequence	4	3	2	1	4	3	5	4	3	2	1	5
Memory Frame 1st	4	4	4	4	4	4	5	5	5	5	1	1
2nd		3	3	3	3	3	3	4	4	4	4	5
3rd			2	2	2	2	2	2	3	3	3	3
4th				1	1	1	1	1	1	2	2	2
Page fault	y	y	y	y	n	n	y	y	y	y	y	y

Total no of page fault = 10

Consider a logical address space of 8 pages of 1024 words mapped into memory of 32 frames.
How many bits are there in the logical address?

A.9 bits

B.11 bits

C.13 bits

D.15 bits

Option: C

Explanation :

Logical address will have 3 bits to specify the page number (for 8 pages). 10 bits to specify the offset into each page (2^{10} = 1024 words) = 13 bits.

Consider a logical address space of 8 pages of 1024 words mapped into memory of 32 frames.

How many bits are there in the physical address?

A.9 bits

B.11 bits

C.13 bits

D.15 bits

Option: D

Explanation :

For (2^5), 1132 frames of 1024 words each (page size= frame size) we have 5 + 10 = 15 bits.

A computer system has 4 k word cache organised in a block-set-associative manner, with 4 blocks per set, 64 words per block. The number of bits in the SET and WORD fields of the main memory address format is

A.15, 4

B.6, 4

C.7, 2

D.4, 6

Option: D

Explanation :

There are 64 words in a block. So 4K cache has (4 x 1024)/64 = 64 blocks. Since 1 set has 4 blocks, there are 16 sets. 16 sets needs 4 bits for representation. In a set there are 4 blocks, which needs 2 bits. Each block has 64 words. So, the word field has 6 bits.

The address sequence generated by tracing a particular program executing in a pure demand paging system with 100 records per page, with a free main memory frame is recorded as follows. What is the number of page faults ? 0100,0200,0430,0499,0510,0530,0560,0120, 0220,0240,0260,0320,0370.

A.13

B.8

C.7

D.10

Option: C

Explanation :

When it tries to access 0100, it results in a page fault as the memory is empty. right now. So, it loads the second page (which has the addresses 100-199). Trying to access 200 will result in a page fault, as it is not in memory right now. So the third page with the addresses from 200 to 299 will replace the second page in memory. Trying to access 430 will result in another page fault. Proceeding this way, we find trying to access the addresses 0510, 0120, 0220, 0320 will all result in page faults. So, altogether 7 page faults.

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.

ANS : A

What is the average waiting time using FCFS algorithm

Process	Burst Time	Arrival time
P1	4	0
P2	5	1
P3	3	3
P4	2	2

a.4
b.4.5
c.5
d.5.5

ANS : B

What is the average waiting time using SJF (Non Preemptive) algorithm

Process	Burst Time	Arrival time
P1	4	0
P2	5	1
P3	3	3
P4	2	2

a.3
b.3.25
c.3.5
d.4

ANS : B