

Shorts:

1. A counting semaphore S is initialized to 10. Then, 6 P operations and 4 V operations are performed on S. What is the final value of S?
2. ----- is an IPC mechanism used for related process communication
3. Consider six memory partitions of size 200 KB, 400 KB, 600 KB, 500 KB, 300 KB and 250 KB. These partitions need to be allocated to four processes of sizes 357 KB, 210 KB, 468 KB and 491 KB in that order. Using best-fit allocation strategy process P1 is placed in which partition of the memory
4. Differentiate Contiguous and Non-Contiguous memory allocation techniques
5. State Belady's anomaly.
6. Consider page reference strings 1, 3, 0, 3, 5, 6, and 3 with 3-page frames. Find the number of page faults using the FIFO page replacement algorithm.
7. Write the syntax of ioctl() system call.
8. List any two approaches for free space management on disk
9. Define the term SEEK TIME
10. Consider a disk queue with requests for I/O to blocks on cylinders 98, 183, 41, 122, 14, 124, 65, 67. The FCFS scheduling algorithm is used. The head is initially at cylinder number 53. The cylinders are numbered from 0 to 199. The total head movement (in number of cylinders) incurred while servicing these requests is _____.
11. A counting semaphore S is initialized to 7. Then, 20 P operations and 15 V operations are performed on S. What is the final value of S?
12. Which POSIX library function is used to remove the created Message Queue from the kernel of the OS? Write the syntax of the function
13. Consider six memory partitions of size 200 KB, 400 KB, 600 KB, 500 KB, 300 KB and 250 KB. These partitions need to be allocated to four processes of sizes 357 KB, 210 KB, 468 KB and 491 KB in that order. Using worst-fit allocation strategy process P2 is placed in which partition of the memory
14. Differentiate paging and segmentation
15. State the page replacement algorithms that suffer from Belady's anomaly.
16. Consider page reference strings 1, 3, 0, 3, 5, 6, and 3 with 3-page frames. Find the number of page faults using the Optimal page replacement algorithm.
17. Write the syntax of lseek() system call.
18. State the file allocation methods
19. Define the following
 - a) Seek Time b) Rotational Latency
20. Consider a disk queue with requests for I/O to blocks on cylinders 98, 183, 41, 122, 14, 124, 65, 67. The FCFC scheduling algorithm is used. The head is initially at cylinder number 53 moving towards

Long:

1. Illustrate how the Producer-Consumer problem can be solved by using semaphores.
2. Describe the implementation of inter-process communication using shared memory.
3. Illustrate the internal and external fragmentation problem.
4. Given five memory partitions of 50 KB, 150 KB, 300 KB, 350 KB, and 600 KB (in order), how would each of the first fit, best-fit, and worst-fit algorithms place processes of 300 KB, 25 KB, 125 KB, and 50 KB (in order)? Which algorithm makes the most efficient use of dynamic memory if partitions 50KB,300KB and 600KB are not considered for allocation?
5. Consider a disk queue with requests for I/O to blocks on cylinders 82,170,43,140,24,16,190 The head is initially at cylinder number 50 moving towards larger cylinder numbers on its servicing pass. The cylinders are numbered from 0 to 199. Find the total head movement (in number of cylinders) incurred while servicing these requests using
 - i) SSTF scheduling algorithm
 - ii) SCAN scheduling algorithm
 - iii) C-SCAN scheduling algorithm
 - iv) C-LOOK scheduling algorithm
 - v) LOOK scheduling algorithm
6. What is a critical-section problem? Give a classic Peterson's solution to the critical section problem.
7. Describe the implementation of inter-process communication using message queues.
8. Given five memory partitions of 100 KB, 500 KB, 200 KB, 300 KB, and 600 KB (in order), how would each of the first-fit, best-fit, and worst-fit algorithms place processes of 212 KB, 417 KB, 112 KB, and 426 KB (in order)? Which algorithm makes the most efficient use of memory?
9. Explain the concept of Least Recently Used memory page replacement method and how it is different from First In First Out (FIFO) page replacement method.
10. Explain the following system :
lseek(), stat(), ioctl(), open(),read(),write()
11. Explain various file access methods.
12. Consider a disk queue with requests for I/O to blocks on cylinders 98, 183, 41, 122, 14, 124, 65, 67. The FCFS scheduling algorithm is used. The head is initially at cylinder number 53. The cylinders are numbered from 0 to 199. Find the total head movement (in number of cylinders) incurred while servicing these requests using
 - i) SSTF scheduling algorithm
 - ii) SCAN scheduling algorithm
 - iii) C-SCAN scheduling algorithm

iv) C-LOOK scheduling algorithm

v) LOOK scheduling algorithm