Attempt any two questions. [ 10 \*2=20]

2

1. Why OPR is best but not practically feasible page replacement algorithm? Calculate the number of page faults for OPR, LRU and Clock page replacement algorithm for the reference string: 1, 3, 4, 2, 3, 5, 4, 3, 1, 2, 4, 6, 3, 2, 1, 4, 2. Assume the memory size is 3.
2. Discuss about single level and two level directory system. Consider the following process and answer the following questions.

|  |  |  |  |
| --- | --- | --- | --- |
| Process | Allocation | Max | Available |
|  | A   B    C     D | A    B    C    D | A   B    C     D |
| P0 | 0    0     1     2 | 0     0     1     2 | 1    5      2     0 |
| P1 | 1    0     0     0 | 1      7    5     0 |  |
| P2 | 1    3     5     4 | 2      3     5      6 |  |
| P3 | 0    6     3     2 | 0      6     5      2 |  |
| P4 | 0    0    1     4 | 0    6     5      6 |  |

a. What is the content of matrix Need?

b.  Is the system in safe state?

c.  If P1 request (0,4,2,0) can the request be granted immediately.

1. Compare the long term scheduler, short term scheduler and middle term scheduler with reference to process state diagram. Consider following process data and compute average waiting time and average turnaround time for RR(quantum 10) and priority scheduling algorithms.

|  |  |  |  |
| --- | --- | --- | --- |
| PID | Burst Time | Arrival Time | Priority |
| A | 16 | 0 | 1 |
| B | 37 | 12 | 2 |
| C | 25 | 7 | 3 |

Attempt any eight questions. [ 8\*5=40]

1. When programmed IO is suitable than other IO handling techniques? Explain the process of IO handling using DMA.
2. Explain the difference between external and internal fragmentation. How do you overcome the fragmentation problem in continuous memory allocation?
3. What is dining philosophers problem? Explain the solution of dining philosophers problem using semaphore.
4. Explain the Linked list method of File allocation. Explain the advantage and disadvantage using File allocation Table with linked list.
5. Explain the necessary condition for deadlock? How do you prevent deadlock?
6. Explain OS as Resource manager. Why do we need dual mode in OS?
7. Why using lock doesn’t ensure mutual exclusion? Explain with suitable example.
8. Why thread is called as light weight process? Compare user level thread with Kernel level thread.
9. Explain segmented paging with suitable diagram.
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 cylinders are numbered from 0 to 199. The head is initially at cylinder number 53 moving towards larger cylinder numbers on its servicing pass. Find total head movement (in number of cylinders) incurred while servicing these requests for following algorithms
11. SSTF
12. SCAN
13. C-LOOK