

Operating System

P. Pages : 2

Time : Three Hours



TKN/KS/16/7434

Max. Marks : 80

- Notes :
1. All questions carry marks as indicated.
 2. Solve Question 1 OR Questions No. 2.
 3. Solve Question 3 OR Questions No. 4.
 4. Solve Question 5 OR Questions No. 6.
 5. Solve Question 7 OR Questions No. 8.
 6. Solve Question 9 OR Questions No. 10.
 7. Solve Question 11 OR Questions No. 12.
 8. Assume suitable data whenever necessary.
 9. Illustrate your answers whenever necessary with the help of neat sketches.
 10. Use of non programmable calculator is permitted.

1. a) Define essential properties of the following types of operating systems. 8
- | | |
|-------------------|---------------------|
| i) Batch OS | ii) Time Sharing OS |
| iii) Real Time OS | iv) Distributed OS. |

- b) How does a microkernel differ from conventional kernel? Briefly list the motivation and difficulties behind this. 5

OR

2. a) Describe difference between symmetric and asymmetric multiprocessing. What are the advantages and disadvantages of multiprocessor system? 5

- b) Explain various services provided by OS. 8

3. a) What is Semaphore? What is the difference between a binary and counting semaphore? Explain how improper implementation of a semaphore can lead to a deadlock. 7

- b) Write a short notes on : 7
- i) Monitors.
 - ii) Scheduling Criteria.

OR

4. a) Consider four processes P₁, P₂, P₃, P₄ with length of CPU burst time. Find out average waiting time and average turnaround time for the following algorithm : 9
- i) FCFS
 - ii) RR (Slice = 4 ms)
 - iii) SJF (Preemptive)

Process	Arrival Time	Burst Time
P ₁	0	8
P ₂	1	4
P ₃	2	9
P ₄	3	5

- b) Explain various multithreading models. 5

5. a) What are the necessary conditions for a deadlock situation to arise? Explain in detail. 5
- b) Explain Banker's algorithm for deadlock avoidance with suitable example. 8
- OR**
6. a) What are several methods for enforcement or protection and security threats? Also compare Access list and capability list. 8
- b) What security measures can be used to protect your system from unauthorized access. 5
7. a) Consider the following page reference string 7, 0, 1, 2, 0, 3, 0, 4, 2, 3, 0, 3, 2, 1, 2, 0, 1, 7, 0, 1. How many page fault would occur for the following page replacement algorithm assuming 3 frames. 6
- i) FIFO ii) Optimal iii) LRU
- b) Explain under what circumstances to page fault occur? Describe the action taken by operating system when a page fault occurs. 8
- OR**
8. a) Explain segmentation with paging memory management techniques. 7
- b) What do you mean by address binding? Suggest the time at which address binding is achieved during execution. 7
9. a) Suppose that a disk drive has 5000 cylinder number 0 to 4999. The drive is currently serving at cylinder 155 and previous request was at cylinder 170. The queue of pending request is 86, 1350, 948, 130, 1500, 50. Starting at current head position what is the total distance (in cylinders) that arm moves to satisfy all pending request for each of following disk scheduling algorithm. 8
- FCFS, SSTF, C-LOOK, C-SCAN LOOK.
- b) Explain in brief directory structure. 5
- OR**
10. a) Explain different disk space allocation method. 8
- b) What is the piece of information associated with open file explain each of them. 5
11. a) Explain RAID System. 6
- b) Explain Swap Space Management. 7
- OR**
12. a) Explain Kernel I/O System. 7
- b) Explain application I/O interface. 6
