

NOTE

1. Answer question 1 and any FOUR from questions 2 to 4. Part of the score depends on the number of questions you answer and in the same sequence.

2. Part of the score depends on the number of questions you answer and in the same sequence.

Total Marks: 10

1. What is CPU Scheduling? Write down the scenarios in which a waiting process may be scheduled.

2. Consider two programs that are working on a joint project and need to access shared files in a directory. In some cases, they need to modify existing programs.

3. Consider the context. Why is it necessary to make such a modification?

4. What are the advantages and disadvantages of providing mandatory locks instead of advisory locks when using a lock-free structure?

5. What is the purpose of the kernel's lock manager? Explain its operation.

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7. Define a mutex. Explain its operation. Write down the two main functions used in a mutex-based system.

8. What is a spinlock? Explain its operation. Why is it complicated to implement than single CPU scheduling?

9. Consider the following set of processes:

Process	Block	Arrival	Service
P1	1	1	1
P2	2	2	2
P3	3	3	3
P4	4	4	4
P5	5	5	5

10. Draw Gantt Chart illustrating the execution of the given processes using Round robin policy. Give also a CPU utilization graph using the scheduling algorithm.

11. Compare Round robin and First-come first-served algorithms. Both algorithms are for the algorithm without preemption in a 1:1 average waiting time.

12. Calculate the following types of operating system:

13. First-come first-served

14. Round robin

15. Shortest job first

16. Priority scheduling

17. Explain the following: Operating System want you prefer in the following application: Web browser and Mail client.

18. Explain the following: Real-time operating system

19. Explain the following: Embedded operating system

20. Explain the following: Mobile operating system

20. What is a paging system? Why is it necessary to have almost the whole of operating system code and kernel code in a pageable system? Explain briefly. (3-4)
21. Distinguish between the following terms: (1-4)
- Logical vs physical address
 - Relocation vs paging
 - Relocating vs readdressing
22. What is thrashing? When does it occur? In system? How does an operating system detect thrashing? (3-4)
23. Compute the total address space of 8 pages with 1024 bytes per page mapped into a physical memory of 16K bytes. (1-4)
- How many bits are there in the logical address?
 - How many bits are there in the physical address?
24. Define address independence. Which type of computer memory allocation technique is/are an address independent? Explain by giving an example. (2-4)
25. Let us make the following PDP-11 program that is implementing a file memory through external paging. Give logic for the same. (3-4)
26. What is consistency semantics? Write about UNIX consistency semantics. How UNIX consistency semantics is different from traditional shared file semantics? (1-4)
27. Explain how a disk file is laid out in memory. (1-4)
28. Explain how a disk file is laid out in memory. The same of following system is PDP-11 or a common disk controller system use as 128. The same of following system is PDP-11 or a common disk controller system use as 128. The same of following system is PDP-11 or a common disk controller system use as 128. (1-4)
- PDP-11
 - UNIX
 - OS/2
 - MS-DOS
29. Why are system crashes more dangerous to system security than program crashes? Briefly explain the kind of system crash. (1-4)
30. The disk-based environment, ensuring security of a transaction is difficult. Comment. Which mode of the database operating system ensure security of a transaction? How does it guarantee? (1-4)
31. Give the steps for recovery of (P) and Restoration of (R) (1-4)
- Rollback
 - Undo
 - Redo
 - Recovery
32. The attributes of recovery type R, and R, each restore the system. (1-4)
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