INDUS INSTITUTE OF TECHNOLOGY & ENGINEERING

COMPUTER SCIENCE AND ENGINEERING DEPARTMENT
Operating System [CE0418] Question Bank

Subject Name: Operating System

Subject Code: CE0418

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Semester: CSE 4 [Div. A to F]

==Question Bank is for reference purposes. Mid-semester and End Semester Exam Question papers will be drawn from the syllabus mentioned in the Course file.==

UNIT 1 & 2

1. What is Operating System? Explain different types of operating system.

2. Define operating system. Explain the different views of operating system.

3. Define process. Differentiate between a process and a program.

4. Explain different service provided by operating system.

5. What is Batch operating System? Discuss its advantages and disadvantages.

6. What is Time-sharing operating System? Discuss its advantages and disadvantages.

7. What is distributed operating System? Discuss its advantages and disadvantages.

8. What is Real-time operating System? Discuss its advantages and disadvantages.

9. Difference between process and thread.

10. What is PCB? Discuss its major fields.

11. Explain the microkernel system architecture in detail.

12. Explain monolithic operating system structure.

13. Define a process. Explain the process state transition with a neat diagram.

14. Explain Thread Life Cycle with diagram.

15. What is thread? Explain thread Structure? And explain any one type of thread in details.

16. What is thread and what are the differences between user-level threads and kernel supported threads?

17. Define term Scheduler, Scheduling and Scheduling Algorithm with example.

18. Define mutual exclusion. How mutual exclusion can be achieved?

19. Explain context switching.

20. What is System call? Discuss different types of system calls.

21. Write short note: 1) Semaphores 2) Monitors

22. Define : 1) Critical Section 2) Waiting Time 3) Race condition

23. Explain producer-consumer problem and solve it using semaphore. Write pseudo code for the same.

24. Explain the IPC Problem known as Dining Philosopher Problem.

25. Explain IPC Problem – Readers & Writers Problem.

26. What is Mutex? Write a pseudo code to achieve mutual exclusion using mutex.

27. What do you mean by Deadlock Avoidance? Explain the use of Banker's Algorithm for Deadlock Avoidance with illustration.

28. Consider the snapshot of the system with Five Processes and Four types of resources A,B,C,D. Currently Available set of resources is (1,5,2,0). Find the content of Need Matrix. Is the System in Safe State?

	Allocated Resources				Max. Requirement			
	A	B	C	D	A	B	C	D
P0	0	0	1	2	0	0	1	2
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	2

29. Which are the necessary conditions for Deadlock? Explain Deadlock recovery in brief.

30. What is Deadlock? List the conditions that lead to deadlock. How Deadlock can be prevented?

31. Difference between deadlock and starvation.

32. What is RAG? Explain briefly.

33. Find average waiting time for Shortest job first scheduling, and Round robin scheduling algorithm.

Process	CPU burst time
P1	6
P2	8
P3	5
P4	2

CPU burst time is given in millisecond and time quantum is 4.

34. Solve following by SJF preemptive and non-preemptive. Draw Gantt Chart, Average Waiting Time and Average Turnaround Time. Which one is better as per average turnaround time?

Process	Arrival Time	Burst Time
P1	0	7
P2	2	4
P3	4	2
P4	7	1

35. Consider the following set of processes with the length of CPU burst time given in the milliseconds.

Process	Arrival Time	Burst time	Priority
P1	0	8	3
P2	1	1	1
P3	2	3	2
P4	3	2	3
P5	4	6	4

Calculate average turnaround time and average waiting time for First-come first served scheduling, Shortest job first scheduling and Priority scheduling algorithm.

36. Write a Shell Script to find factorial of given number.

37. Explain following Commands in UNIX : man, cat, sort, grep, chmod, head, tail, ls, mkdir, rmdir,

38. Write a shell script to find greater number out of 3 numbers.

39. Solve following by Round Robin process scheduling algorithm. Draw Gantt Chart, Average Waiting Time and Average Turnaround Time for time slice=4 and time slice=2.

Process	Arrival Time	Burst Time
P1	0	7
P2	2	4
P3	3	2
P4	9	1

UNIT 3

40. Explain fragmentation in detail.

41. If FIFO page replacement algorithm is used with 4 page frames and 8 pages, how many page faults will occur with reference string 0, 1, 2, 4, 7, 2, 0, 3, 4, 7 if four page frames are initially empty? Solve the same problem for LRU page replacement algorithm.

42. What is called TLB? How does it help to speed up paging?

43. What is called segmentation? Define Segmentation. How it differs from paging?

44. Explain the following allocation algorithms: 1) First-fit 2) Best-fit 3) Worst-fit

45. Explain Swapping in Detail.

46. Explain the Segmentation in detail with suitable diagram.

47. Explain the Multiprogramming with fixed partitions in detail with suitable diagram.

48. Explain the Multiprogramming with Dynamic or Variable partitions in detail with suitable diagram.

49. For 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. Calculate the page faults applying the following Page Replacement Algorithms for a memory with three frames: (i) Optimal (ii) LRU (iii) FIFO

50. Explain TLB and Virtual Memory.

51. Give the name of technique used for overcoming external fragmentation.

52. What is paging? Explain Paging mechanism in MMU with example.

53. What is called device driver? Explain its function in brief.

54. What is RAID? Explain in brief

55. Disk requests come in to the disk driver for cylinders 10, 22, 20, 2, 40, 6, and 38, in that order. A seek takes 6 msec per cylinder moved. How much seek time is needed for FCFS, Elevator algo. In all cases, the arm is initially at cylinder 20.

56. Write short note: RAID levels.

57. Explain SSTF and LOOK disk scheduling algorithms.

58. Explain the goals of I/O software.

59. Explain any three Disk Arm Scheduling algorithms with suitable illustrations.

60. Define: rotational latency

61. Write a short note on DMA.

62. Suppose Disk drive has 300 cylinders. The current position of head is 90. The queue of pending request is 36,79,15,120,199,270,89,170 Calculate head movement for FCFS and SSTF algorithms.

UNIT 4

63. What are the various operations performed in a File?

64. What are the operations performed in a Directory?

65. What are the different directory structures available?

66. What are the different methods for allocation in a File System?

67. What is meant by Free Space List?

68. What are File Attributes?

69. What are the Access methods available?

70. What is meant by Executable file?

71. What is meant by File Pointer?

72. List the different file implementation methods and explain them in detail.

73. Explain File Allocation Methods from the following: (i) Contiguous Allocation (ii) Linked Allocation (iii) Indexed Allocation

74. Explain all Accessing Methods of File

75. Explain the Trojan Horse and Trap doors program threats.

76. Explain the goals of Operating System Security.

77. List Strategies of strong password.

78. Explain Authentication based on password.

79. Define Term Granularity.

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