Operating Systems Suggestions:

1. What are the main purposes of Operating Systems?
2. Categorize Operating Systems based on their Architecture and Structure. Give a brief description of each.
3. Describe Microkernel.
4. What is the difference between Monolithic Architecture and Layered Architecture?
5. Describe fork() system call with a suitable example
6. Define thread. What are the benefits of multithreading?
7. Differences between user-level and kernel-level thread.
8. Differences between Process and threads
9. What is Daemon process, Zombie Process and Orphan Process?
10. What is Shell and kernel? Describe each of them.
11. What is System Call? List out any four Process Control System Calls.
12. Briefly Explain the different types of systems: parallel systems, distributed systems and real-time systems?
13. What is the difference between Multitasking and Multiprogramming Operating Systems?
14. Explain the process of booting.
15. Define Process. What are the different states of a process? Explain with a diagram.
16. What are the attributes of a process?
17. Describe PCB.
18. Define CPU Bound Process and I/O Bound Process.
19. Define TAT,WT,RT,WT.
20. Explain pre-emptive and non pre-emptive scheduling along with examples.
21. Differentiate between Long term,short term and mid term schedulers
22. Advantages and disadvantages of FCFS, SJF, SRTF and RR.
23. Demonstrate FIFO and Round Robin CPU scheduling algorithms with suitable examples.
24. Explain Multilevel Queue Scheduling.
25. Explain Multilevel Feedback queue scheduling.
26. *[Problem solving on CPU Scheduling (FCFS, SJF,Priority, SRTF, RR)]*
27. What do you mean by Process Synchronization? What are the necessary conditions to achieve synchronization?
28. Explain Inter Process Communication?
29. What are the fundamental models of Inter Process Communication?
30. What is the Critical Section Problem?
31. What are the requirements that need to be satisfied by any solution to Critical Section Problem?
32. Explain Peterson's Solution.
33. What is the Strict Alteration Problem?
34. Give a solution to a two process Critical Section Problem?
35. What do you mean by Semaphore and why is it used?
36. Name the different kinds of operations that are possible on Semaphore?
37. Explain Binary Semaphore.
38. State the Reader-Writers Problem and give a solution using semaphore.

39. Explain Producer-Consumer problem and its solution using Semaphore.
40. Describe the Dining Philosopher problem and its solution.
41. If the initial value of Semaphore S is 22 and 1down() operations, 6 up() operations and 7 down() operations have been performed in a sequential manner. What is the final value of S?
42. State the differences between starvation and deadlock.
43. What is Starvation and Aging?
44. What are the necessary conditions for deadlock to occur? Explain each of it.
45. What do you mean by Deadlock Prevention?
46. Is it possible to have a deadlock involving only one process? Explain.
47. What are the Deadlock Handling Techniques in Operating Systems?
48. Explain Deadlock avoidance using the Resource Allocation Graph.
49. What is the purpose of Banker's Algorithm?
50. *[Problem solving on Bankers Algorithm and Resource Allocation Graph]*
51. Explain with the help of examples FIFO and LRU, optical page replacement algorithms with example reference string. Mention the merits and demerits of each of the above.
52. Differentiate between paging and segmentation.
53. What is the cause of thrashing? How does the system detect thrashing?
54. Explain the concept of demand paging in detail with neat diagrams.
55. Given a memory partition of 100 KB, 500 KB, 200 KB and 600 KB (in order). Show with a neat sketch how each of the first-fit, best-fit and worst-fit algorithms place processes of 412 KB, 317 KB, 112 KB and 326 KB (in order).
56. Illustrate the page-replacement algorithms i) FIFO ii) Optimal Page Replacement use the reference string 7, 0,1, 2, 0, 3, 0, 4, 2, 3, 0, 3, 2,1, 2, 0, 1, 7, 0,1 for a memory with three frames.
57. What is the purpose of paging the page tables?
58. What is a File? Describe the attributes of a file.
59. Write short notes on: i) FCFS and ii) SSTF Disk Scheduling schemes.
60. What are the disadvantages of single contiguous memory allocation? Explain.
61. Discuss various issues involved in selecting appropriate disk scheduling algorithms.
62. What is TLB? Explain with a neat diagram
63. Short note: a) External and Internal fragmentation b) Dynamic loading and linking
64. Given the memory partition of 200k, 700k, 500k, 300k, 100k, 400k. Apply first fit and best fit to place 315k, 427k, 250k, 550k.
65. Given the following sequences 95,180,34,119,11,123,62,64 with the head initially at track 50 and ending at track 199. What is the total disk travelled by the disk arm to satisfy the request using FCFS, SSTF, LOOK, CLOOK algorithm.