1. Discuss the issues of designing and implementation of distributed file system?
2. Explain scheduling policies of real time systems?
3. Explain design approaches of operating system? What are their advantages and Disadvantages?
4. What is process Synchronization? Explain issues in Process synchronization in multiprocessor systems?
5. Expalin classifications of real time systems?
6. What is thread?What are different level of threads and their advantages and disadvantages?
7. Expalin classification of mutual exclusion algorithm.Explain any one algorithm for each?
8. Wxplain Suzuki Kasami algorithm with example.Analyze the best and worst case scenario?
9. Expalin any two distibuted deadlock detection algorithms?
10. Discuss multiprocessor operating system design issues?
11. What are characterstics of RTOS? Expalin microkernel and monolithic kernel?
12. What are components of load distributing algorithms?
13. Determine wether the following set of periodic real time task is schedulable under RMS for uniprocessor system.

    T1=(e1=20,p1=100); T2=(e2=30,p2=150); T3=(e3=60,p3=200);

14. Write short note on Lamport logic clocks.
15. What are design approaches of operating systems? Why different approaches are used for designing O.S? Discuss advantage and disadvantage of each approach?

16. What is distributed deadlock detection? What are different classes of distributed deadlock detection? Expalin any two distributed deadlock detection algorithms?
17. What do understand by term rael time? How is concept of real time different from traditional notion time? Expalin your answer with help of example?
18. Discuss the issues in processor scheduling? Expalin smart scheduling and affinity based scheduling in multiprocessor scheduling?
19. Short note on application of RTOS
20. Short note on Fault tolerance in multiprocessor O.S?
21. What are the different types of multiprocessor O.S. Discuss their merits and demerits
22. What are the design issues for multiprocessor scheduling?
23. Discuss different multiprocessor scheduling strategies.
24. Discuss some techniques for multiprocessor synchronization.
25. Discuss the issues in processor scheduling in multiprocessor systems.
26. Write a short note on fault detection and recovery in multiprocessor systems.
27. Explain Test-and-set and Compare-and-swap instructions for synchronization.
28. Explain the advantages of DSM. Explain migration algorithm for implementing DSM.
29. Explain the write-through cache consistency protocol. What is the action taken by a cache in reponse to its own CPU's operation when the following events occur i) Read miss, ii) Read Hit, iii) Write miss, iv) Write hit. Mention one disadvantage of this protocol.
30. Discuss the commonly used approaches to real-time scheduling.
31. Compare and contrast EDF and LST real time scheduling algorithms.
32. Explain in brief:

a. Spin-lock and Sleep-Lock
b. Gang Scheduling
c. Affinity Based scheduling

33. Write short notes on:
    a. Classification of RTOS
    b. Symbian OS
    c. Android OS
    d. Algorithms for implementing DSM.
34. Compare and contrast Monolythic kernel with Microlythic kernel.
35. A Distributed system may have multiple independent critical regions. Imagine that process 0 wants to enter critical region A and process 1 wants to enter critical region B. Can Ricart Agarwala's algorithm lead to deadlocks? Justify your answer.
36. "Simultaneous execution of the edge chasing algorithm (without priorities) could result in phantom Deadlocks". Justify this statement with the help of examples. Suggest a means of resolving such false deadlocks
37. Multiple transactions need to be executed simultaneously in different processes.
38. What are the different concurrency control approaches to handle such simultaneous transactions? Can these approaches prevent deadlocks?
39. How are files replicated and updated in Distributed File Systems?
40. How does NFS automounting help to improve the performance and scalability of NFS?
41. What is a logical clock?? Discuss its significance in a distributed system.

42. Discuss the four necessary and sufficient conditions for a deadlock to occur. Give suitable examples to show that a deadlock cannot occur if one of the four conditions is absent.
43. Explain with an example how the presence of a cycle in a RAG is a necessary but not sufficient condition for a deadlock to occur.
44. Discuss various issues in deadlock recovery.
45. Differentiate wound-wait and wait-die schemes.
46. What characterizes all NFS remote procedures?
47. What are the main advantages and main disadvantages of stateful and stateless servers?
48. What is a state file handle? What does NFS do to detect them?
49. What are the design issues in DOS? Justify the feasibility of the design issues.
50. What are physical clocks? How can synchronization be achieved in various physical clocks? Discuss with examples.
51. Consider a network consisting of 5 computers, A (coordinator), B, C, D, and E. At 14:00 the coordinator decides to synchronise the clock of all computers in the network. At that moment, the clock of every computer in the network shows the following. Apply the Berkley clock synchronisation algorithm to this situation, show the stages of computation, and write what will be the outcome of the synchronisation. The time needed for computation and for network communication is negligible.

    A 14:00 B 13:57 C 14:05 D 13:58 E 14.05

52. How could the correction be done if there was no co-ordinator?
53. State in brief what happens if: two processes detect the demise of a co-ordinator simultaneously and both decide to hold election using the bully algorithm.

54. Explain the working of a decentralized mutual exclusion algorithm.
55. What are logical clocks? How can synchronization be achieved using the same?
56. Lamport's vector timestamps…..explanation or problem
57. Exaplain distributed mutual exclusion algorithms.
58. Distributed deadlock handling algorithms(one of each category)
59. Compare and contrast Monolythic kernel with Microlythic kernel.
60. A Distributed system may have multiple independent critical regions. Imagine that process 0 wants to enter critical region A and process 1 wants to enter critical region B. Can Ricart Agarwala's algorithm lead to deadlocks? Justify your answer.
61. "Simultaneous execution of the edge chasing algorithm (without priorities) could result in phantom Deadlocks". Justify this statement with the help of examples. Suggest a means of resolving such false deadlocks.
62. What are the design issues in DOS? Justify the feasibility of the design issues.
63. What are physical clocks? How can synchronization be achieved in various physical clocks? Discuss with examples.
64. What is a logical clock?? Discuss its significance in a distributed system.
65. Explain the concept of Lamport's vector timestamps with the help of an example.
66. Discuss the four necessary and sufficient conditions for a deadlock to occur. Give suitable examples to show that a deadlock cannot occur if one of the four conditions is absent.
67. Explain with an example how the presence of a cycle in a RAG is a necessary but not sufficient condition for a deadlock to occur.
68. Discuss various issues in deadlock recovery.

69. Differentiate wound-wait and wait-die schemes. A process with timestamp 100 needs a resource held by a process with time stamp 50. Discuss what happens in a) Wait-die b) Wound-wait.
70. Suppose all processes in the system are assigned priorities that can be used to totally order the processes. Modify CMS algorithm so that when a process detects a deadlock it knows the lowest priority deadlocked process.
71. Give an example to show that in AND request model, false deadlocks occur due to deadlock resolution in distributed system.
72. Compare and contrast Ho-Ramamoorthy's one phase and two phase deadlock detection algorithms.
73. Differentiate between an edge chasing deadlock detection algorithm and a path pushing algorithm.
74. Discuss the different types of distributed deadlock detection algorithms and comment on the deadlock resolution method in each.
75. Explain Ricart Agarwala's algorithm for distributed mutual exclusion. What is the drawback of this algorithm? Suggest an improvement.
76. Explain Suzuki Kasami algorithm for distributed mutual exclusion.
77. A system uses pre-emption method of deadlock prevention. System currently has 5 transactions T1, T2, T3, T4, and T5. With timestamp t1, t2, t3, t4, t5 respectively (t1>t2>t3>t4>t5). Explain what happens if:
    a. System uses wait-die scheme and T2 requests for a resource held by T5
    b. System uses wait-die scheme and T4 requests for a resource held by T1
    c. System uses wound-wait scheme and T3 requests for a resource held by T4
    d. System uses wound-wait scheme and T5 requests for a resource held by T2.

78. Differentiate between an edge chasing deadlock detection algorithm and a path pushing algorithm.
79. Discuss Chandy Mishra Haas algorithm and show how deadlocks are detected and resolved. Could this algorithm could result in false deadlocks. Justify.
80. What are the different classes of distributed deadlock detection algorithms? Explain CMS algorithm with the help of an example. How many messages are exchanged at most to detect a deadlock involving 14 processes and 4 sites using this algorithm?
81. Show that in Lamport's algorithm the critical section is accessed according to increasing order of timestamps. How does the Ricart Agarwala algorithm improve upon Lamport's algorithm for mutual exclusion?
82. Compare and contrast Ho-Ramamoorthy's one phase and two phase deadlock detection algorithms.
83. Explain any one token based algorithm for distributed mutual exclusion. Discuss drawbacks if any.