

CS2506

2016/2017

Review

Sample of questions

Prepare lecture notes L1-L16 for the exam. The exam paper may include questions as listed below, variations of them or compositions of several.

Give comprehensive answers that address the respective question.

1. Explain the structure of the OS and the role of each layer.
2. Analyse the structure and functions provided by the kernel of an OS.
3. How can a user program enter the kernel? Explain the trap mechanism.
4. Give a classification of OS.
5. Give a definition of the process and analyse it.
6. What are the main components of the process context?
7. Analyse the set of operations used for process management, considering their outcome.
8. Use an example to discuss what a child process is and how it is created.
9. Explain the concept of thread and its benefits. How is a thread managed?
10. Explain the purpose of process scheduling.
11. Use a numeric example to analyse the shortest process first scheduling strategy.
12. What is priority scheduling? In this context, explain the concept of dynamic priorities.
13. Use a diagram to analyse the multilevel feedbacks queue scheduling strategy.
14. Explain the rationale behind two-level scheduling.
15. In the context of real-time scheduling, explain the earliest deadline first scheduling technique.
16. What is the main challenge of the scheduler in a multi-core system?
17. Analyse the idea of process group scheduling.
18. Explain how the scheduling domain works. Present and discuss examples of policies.
19. What is active balancing?
20. Choose and explain a couple of UNIX process system calls.
21. Explain how UNIX is using the process table.
22. What elements define UNIX scheduling?
23. What scheduling strategies are used by Win NT?
24. Explain the component structure of TinyOS.
25. Analyse Android application's lifecycle using a diagram.
26. How are activities managed with tasks in Android?
27. Compare two different OS in terms of process management.
28. Show and comment Linux process state diagram.

29. How is the process ID allocated in Linux?
30. Present the steps of creating a child process in Linux by fork(), vfork(0) or clone().
31. Characterise Linux scheduling by its key features.
32. How is Linux computing priorities?
33. Comment on the difference between virtual addresses and physical addresses.
34. Present methods used to translate virtual addresses into physical addresses.
35. Explain the mechanism of memory pages and the general content of the page table entry.
36. What mechanisms can be used and how for the effective management of page tables?
37. How does the OS manage free memory space? Explain the free bitmap solution.
38. How does the OS manage free memory space? Explain the linked list solution. Discuss how this solution can be made more efficient.
39. What is memory fragmentation and how can it be minimized?
40. Compare the first fit, next fit, best fit and worst fit memory allocation strategies by using an example.
41. Analyse the buddy memory allocation algorithm.
42. Analyse the swapping technique of memory management. What is demand paging?
43. Compare two memory replacement strategies, “first in first out” and “second chance”.
44. Compare two memory replacement strategies, “second chance” and “the clock algorithm”.
45. Compare two memory replacement strategies, “not recently used” and “least recently used”.
46. Compare two memory replacement strategies, “least recently used” and “not frequently used”.
47. Analyse the working set strategy for memory replacement. What criterion is used to set the values of the two thresholds? Discuss how Win NT implements this strategy.
48. Explain Linux slab allocator system.
49. How does a device driver work?
50. Explain the concept of driver families.
51. What happens when a new device is plugged into the PCI bus of a computer?
52. Explain the structure of a device driver. What are water marks?
53. How are I/O devices represented in UNIX?
54. Compare two I/O schedulers.
55. Draw and discuss Android sensor subsystem.
56. What is the role of the Android application framework and how does it operate?
57. What is an Android sensor event?
58. Describe the Android event report modes.
59. How does the OS provide exclusive access to a file?
60. Explain the concept of file metadata. What is included in the metadata?
61. How does the OS manage free storage space?
62. Explain the purpose of Linux Virtual File System.
63. What are the main components of Linux VFS and how do they interact?
64. What are a superblock and an i-node?
65. Explain how RAID improves reliability.

66. Explain RAID level 0-6.

67. Compare different levels of RAID between themselves, for example RAID level 0 and level 1, or level 1 and level 2.