QUESTION BANK

Module 1

1. How are network computers different from traditional personal computers? Describe some usage scenarios in which it is advantageous to use network computers.

2. What network configuration would best suit the following environments?

    a. A dormitory floor

    b. A university campus

    c. A state

    d. A nation

3. Give two reasons why caches are useful. What problems do they solve? What problems do they cause? If a cache can be made as large as the device for which it is caching (for instance, a cache as large as a disk), why not make it that large and eliminate the device?

4. Under what circumstances would a user be better off using a timesharing system rather than a PC or a single-user workstation?

5. List the four steps that are necessary to run a program on a completely dedicated machine-a computer that is running only that program.

6. How does the distinction between kernel mode and user mode function as a rudimentary form of protection (security) system?

7. In a multiprogramming and time-sharing environment, several users share the system simultaneously. This situation can result in various security problems.

a. What are two such problems?

b. Can we ensure the same degree of security in a time-shared machine as in a dedicated machine? Explain your answer.

8. Describe a mechanism for enforcing memory protection in order to prevent a program from modifying the memory associated with other programs.

9. What are the trade-offs inherent in handheld computers?

10. Distinguish between the client-server and peer-to-peer models of distributed systems.

11. Some computer systems do not provide a privileged mode of operation in hardware. Is it possible to construct a secure operating system for these computer systems? Give arguments both that it is and that it is not possible.

12. What are the main differences between operating systems for mainframe computers and personal computers?

13. Which of the following instructions should be privileged?

a. Set value of timer

b. Read the clock

c. Clear memory

d. Issue a trap instruction.

e. Turn off interrupts

f. Modify entries in device-status table

g. Switch from user to kernel mode

h. Access I/O device

14. Discuss, with examples, how the problem of maintaining coherence of cached data manifests itself in the following processing environments:

a. Single-processor systems

b. Multiprocessor systems

c. Distributed systems

15. Identify several advantages and several disadvantages of open-source operating systems. Include the types of people who would find each aspect to be an advantage or a disadvantage.

16. How do clustered systems differ from multiprocessor systems? What is required for two machines belonging to a cluster to cooperate to provide a highly available service?

17. What is the main difficulty that a programmer must overcome in writing an operating system for a real-time environment?

18. Direct memory access is used for high-speed I/O devices in order to avoid increasing the CPU's execution load.

a. How does the CPU interface with the device to coordinate the transfer?

b. How does the CPU know when the memory operations are complete?

c. The CPU is allowed to execute other programs while the DMA controller is transferring data. Does this process interfere with the execution of the user programs? If so, describe what forms of interference are caused.

19. Identify which of the functionalities listed below need to be supported by the operating system for (a) handheld devices and (b) real-time systems.

a. Batch programming

b. Virtual memory

c. Time sharing

20. Some CPUs provide for more than two modes of operation. What are two possible uses of these multiple modes?

21. Define the essential properties of the following types of operating systems: a. Batch b. Interactive c. Time sharing d. Real time e. Network f. Parallel g. Distributed h. Clustered i. Handheld

22. Describe the differences between symmetric and asymmetric multiprocessing. What are three advantages and one disadvantage of multiprocessor systems?

23. The issue of resource utilization shows up in different forms in different types of operating systems. List what resources must be managed carefully in the following settings:

a. Mainframe or minicomputer systems

b. Workstations connected to servers

c. Handheld computers

24. What is the purpose of interrupts? What are the differences between a trap and an interrupt? Can traps be generated intentionally by a user program? If so, for what purpose?

25. Consider a computing cluster consisting of two nodes running a database. Describe two ways in which the cluster software can manage access.

UNIT WISE:

UNIT 1: INTRODUCTION TO OPERATING SYSTEMS & THEIR CLASSIFICATION

Objective: The main objective of this chapter is to study the Operating system basics & Classifications.

1. What are the 3 main purposes of an Operating System?

2. Explain the concept of virtual machines.

3. Explain the distinguishing features of

i) Real time system

ii) Multiprocessor system

4. What is the purpose of command interpreter? Why is it usually separate from the Kernel?

5. What is an Operating System? Explain considering different possible views

6. What is operating system? What are functions of operating system?

7. What are multiprocessor systems? Give advantages.

8. What is the main difficulty that a programmer must overcome in writing an operating system for real time environment?

9. Define spooling and the need for it. Explain its working with necessary diagrams.

10. Explain the following terms and their working with diagram

a) Buffering

b) Spooling

c) Time sharing

d) Distributed system

e) Real-time

11. Compare tightly coupled systems with loosely coupled systems.

12. Describe differences between symmetric and asymmetric multiprocessing. What are three advantages and one disadvantages of multiprocessor systems?

13. Explain distinguished features of

i) Time-sharing system

ii) Parallel processing

14. Write a brief note on different operating system structures

15. Explain different sub components of an operating system.

16. Bring out the requirements of

i) Real time operating systems

(ii) Distributed operating systems

17. What is an Operating System? Justify the statement “Operating System can be viewed as a government, resource allocator and a control program”.

18. Define essential properties of the following types of Operating system:

i) Batch operating system

ii) Interactive operating system

ii) Time sharing operating system

iv) Real time operating system

v) Distributed operating system.

19. Distinguish among the following terminologies associated with the operating system and explain each of them in detail.

i) Multiprogramming systems.

ii) Multitasking systems.

iii) Multiprocessor systems.

20. Define Operating systems. Discuss its role with user and viewpoints 6

21. Define a virtual machine (VM). With a neat diagram, explain the working of a VM. What are the benefits of a VM?

22. Explain the 'graceful degradation' and 'fault tolerant' in a multiprocessor system.

23. Write and explain the sequence of system calls for copying a file to another (new) file.

24. What are system calls? Explain the different categories of the system calls.

UNIT 2: OPERATING SYSTEM STRUCTURES

Objective: The Operating System provides certain services to programs and to the users of those programs in order to make their tasks easier. The services differ from the operating system to another, but we identify and explore some common classes of these services.

1. List out services provided by the Operating Systems?

2. What are client server systems & Peer-to-Peer systems?

3. What is the purpose of the system calls & system programs?

4. Explain the layered approach of the operating system

5. Write short notes on operating system components.

6. Describe process states with the help of process transition diagram

7. What is the main difficulty that a programmer must overcome in writing an operating system for real time environment?

8. Give difference between Job-scheduling & CPU-scheduling.

9. Define spooling and the need for it. Explain its working with necessary diagrams.

10. What is the meaning of overlapped CPU and I/O operation? Explain.

11. Distinguish between:

i) Process and Program

ii) Multiprogramming and multiprocessing

iii) Job scheduling and CPU scheduling

12. What are system calls? What are categories of system calls?

13. What are the five major activities of an operating system in regard to file management

14. What are the five major activities of an operating system in regard to process management?

15. What are the three major activities of an operating system in regard memory management

16. What are the three major activities of an operating system in regard to secondary storage management

17. Explain the functions of the following:

i) System Calls

ii) System programs

iii) Command Interpreter

18. Explain the layered approach to the structuring of an operating system along with the relevant diagram

19. List out and explain briefly the various services that the operating system provides to programs and users.

20. Explain the different system components of an operating system.

21. What is the purpose of command interpreter? Why is it usually separate from kernel?

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