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CS6401- Operating System

QUESTION BANK

UNIT-I

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Part-A

1. What is an Operating system?

An operating system is a program that manages the computer hardware. It also provides a basis for application programs and act as an intermediary between a user of a computer and the computer hardware. It controls and coordinates the use of the hardware among the various application programs for the various users.

2. List the services provided by an Operating System?
   - Program execution
   - I/O Operation
   - File-System manipulation
   - Communications
   - Error detection

3. What is the Kernel?

A more common definition is that the OS is the one program running at all times on the computer, usually called the kernel, with all else being application programs.

4. What is meant by Mainframe Systems?

Mainframe systems are the first computers developed to tackle many commercial and scientific applications. These systems are developed from the batch systems and then multiprogramming system and finally time sharing systems.

5. What is meant by Batch Systems?

Operators batched together jobs with similar needs and ran through the computer as a group .The operators would sort programs into batches with similar requirements and as system become available, it would run each batch.

6. What is meant by Multiprogramming?

Several users simultaneously compete for system resources (i.e) the job currently waiting for I/O will yield the CPU to another job which is ready to do calculations, if another job is waiting. Thus it increases CPU utilization and system throughput.

7. What is meant by Time-sharing Systems?

Time Sharing is a logical extension of multiprogramming .Here, CPU executes multiple jobs by switching among them, but the switches occur so frequently that the users can interact with each program while it is running.

8. What are the Components of a Computer System?

Application Programs

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System Program

Operating System

Computer Hardware

9. What are the advantages of Multiprogramming?

Increased System Throughput

Increased CPU utilization

10. What is Multiprocessor System?

Multiprocessor systems have systems more than one processor for communication, sharing the computer bus, the memory, clock & peripheral devices.

11. What are the advantages of multiprocessors?
Increased throughput
Economy of scale
Increased reliability

12. What are Multiprocessor Systems & give their advantages?

Multiprocessor systems also known as parallel systems or tightly coupled systems are systems that have more than one processor in close communication, sharing the computer bus, the clock and sometimes memory & peripheral devices. Their main advantages are,

- ❖ Increased throughput
- ❖ Economy of scale
- ❖ Increased reliability

13. What are the different types of Multiprocessing?

Symmetric multiprocessing (SMP): In SMP each processor runs an identical copy of the OS & these copies communicate with one another as needed. All processors are peers. Examples are Windows NT, Solaris, Digital UNIX, and OS/2 & Linux.

Asymmetric multiprocessing: Each processor is assigned a specific task. A master processor controls the system; the other processors look to the master for instructions or predefined tasks. It defines a master-slave relationship. Example: SunOS Version 4.

14. What is meant by clustered system?

Clustered systems are collection of multiple CPUs to accomplish computational work. Those systems share storage and are closely linked via LAN networking.

15. What are the types of clustering?

Asymmetric Clustering

Symmetric Clustering & Clustering over a WAN

16. What is meant by Asymmetric Clustering?

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In this clustering, one machine is in hot standby mode, while the other is running the application. The hot standby machine just monitors the active server. If that server fails, hot standby host become the active server.

17. What is meant by Symmetric clustering?

Two or more hosts are running applications and they are monitoring each other. This clustering requires more than one application be available to run and it uses all of the available hardware.

18. What is meant by parallel clusters?

Parallel clusters allow multiple hosts to access the same data on the shared storage. Each machine has full access to all data in the database.

19. What is meant by Real time system?
Real time systems are systems that have their in-built characteristics as supplying immediate response. In real time system, each process is assigned a certain level of priority according to the relative importance of the events to be processed.

20. What are the advantages of distributed systems?

Resource sharing

Load balancing

Reliability

Communication link easy

21. What are the applications of real-time systems?

Controlling the machines

Instruments

Industrial process

Landing & tasking off aero planes

Real time simulations

Military applications.

22. What are the types of Real time systems?

Hard Real Time System

Soft Real Time System

23. What is meant by Hard Real time systems?

They are generally required to and they guarantee that the critical tasks are completed in given amount of time.

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24. What is meant by soft real time system?

It provides priority to the tasks based on their criticality. It does not guarantee completion of critical tasks in time.

25. What is meant by distributed systems?

A distributed system is basically a collection of autonomous computer systems which co-operate with one another through their h/w and s/w interconnections.

26. What are the disadvantages of distributed systems?

Security weakness

Over dependence on performance and reliability

Maintenance and control become complex

27. What are the modes of operation in Hardware Protection?

User Mode

Monitor Mode

28. What are Operating Services?

Normally, an operating system provides certain services to programs and to the users of those programs. Some of them are:

Program Execution.

I/O operations

File-system manipulation

Communications

Error Detection

29. What is System Programs?

System programs provide a convenient environment for program development and execution. Some of these programs are user interfaces to system calls and others are more complex. Some of them are:

File Management

Status Information

File modification

Programming Language support Program loading,

Execution and communication.

30. What are System Calls?

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System calls provide the interface between a process and the Operating system. System Calls are also called as Monitor call or Operating-system function call. When a system call is executed, it is treated as by the hardware as software interrupt. Control passes through the interrupt vector to a service routine in the operating system, and the mode bit is set to monitor mode.

31. What are the five major categories of System Calls?

- Process Control
- File-management
- Device-management
- Information maintenance
- Communications
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32. What is the use of Fork and Exec System Calls?

Fork is a System calls by which a new process is created. Exec is also a System call, which is used after a fork by one of the two processes to replace the process memory space with a new program.

PART-B

1. Discuss about the evolution of Virtual machines. Also explain how virtualization could be implemented in operating systems.

2. Sketch the structure of direct memory Access in detail.

3. Explain the various types of System calls with an example for each.

4. Discuss about the functionality of system boot with respect to operating system.

5. Explain the operating system structure and its component.

6. Define operating system and list out the function and component of operating system.

7. Differentiate symmetric and asymmetric multiprocessing system.

8. In what ways is the modular kernel approach similar to the layered approaches

9. Explain the various memory hierarchies with neat block diagram

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