However, this approach has not yet become as popular as the Microkernel approach and a lot of research and development activity is going on this field.

The design of an operating system is a major task. The goals of the system must be well defined before the design begins. They from the foundation for choices among various algorithms and strategies that will be necessary.

For the implementation of these algorithms and strategies various services provided by the operating system are considered. These services are provided to the programs and the users of these programs such as program execution, I/O operation, File system manipulation, Communication, Error detection, Resource allocation, Accounting, Security and protection. These service are managed through system calls generated by the Kernel or System programs.

Finally, a concept of virtual-machine is illustrated which is implemented by its two components CP and CMS. This approach is useful when more than one processes are executing in a system simultaneously. This approach provides an interface between each programs to eliminate mutual interference between users. It also permits each user to select an OS of his choice to execute on his virtual machine.

Operating Systems are now almost written in a system-implementation language or in a high-level language which improves their implementation, maintenance, and portability.

EXERCISES

Multiple Choice Questions:

2.1 Which of the following activity is not the responsibility of an OS in connection with Process Management :

(*a*) Process creation (*b*) Synchronization
(*c*) deadlock (*d*) Buffering

2.2 What name is given to the programs inside the computer which makes it usable ?

(*a*) application software (*b*) system software
(*c*) firmware (*d*) share ware.

2.3 Which of the following system software does the job merging the record from two files into one ?

(*a*) Security software (*b*) Utility program
(*c*) Networking software (*d*) Documentation system

2.4 MS-DOS

(*a*) does not support multiprogramming (*b*) supports multiprogramming to some extent
(*c*) supports multiprogramming fully (*d*) none of these.

2.5 Windows is a (*n*)

(*a*) Operating system (*b*) user interface
(*c*) operating environment (*d*) programming platform.

2.6 A program is

(*a*) a device that performs a sequence of operations
(*b*) a device where informations are stored
(*c*) a sequence of instructions
(*d*) None of these.

2.7 A process is
(*a*) a device that performs a sequence of operations.
(*b*) a device where informations are stored
(*c*) an instance of a program at the time of execution.
(*d*) a program.

2.8 _____ is the interface between the user and the operating system.
(*a*) I/O system (*b*) command-interpreter
(*c*) System calls (*d*) Kernel.

2.9 _____ provide the interface between a process and the operating system.
(*a*) I/O system (*b*) command-interpreter
(*c*) system calls (*d*) Kernel.

2.10 _____ provide a convenient environment for program development and execution.
(*a*) System programs (*b*) application programs
(*c*) system calls (*d*) Kernel.

2.11 The innermost layer of the operating system close to the hardware.
(*a*) Application program (*b*) system program
(*c*) Kernel (*d*) Hardware layer.

2.12 In _____ machine is executing operating system instruction.
(*a*) User mode (*b*) system mode
(*c*) safe mode (*d*) normal mode.

2.13 Keeping track of memory falls under _____ management and allocating/deallocating sectors of files falls under _____ management.
(*a*) Processor, memory (*b*) memory, file
(*c*) memory, I/O disk (*d*) Processor, file.

2.14 Most computer systems have a small piece of code, stored in ROM is called _____
(*a*) system program (*b*) linker
(*c*) bootstrap (*d*) command interpreter.

2.15 _____ is the oldest of all approaches used to design an operating system.
(*a*) Monolithic (*b*) Layered
(*c*) Microkernel (*d*) Exokernel.

2.16 The main advantage of the layered architecture is
(*a*) Reliability (*b*) Robustness
(*c*) Modularity (*d*) Portability.

2.17 System calls are available as _____ instructions.
(*a*) machine language (*b*) assembly language
(*c*) high-level language (*d*) none of them.

2.18 Which of the following is the advantage of Micro-Kernel architecture.
(*a*) Robustness (*b*) Security
(*c*) Configurability (*d*) All of these.

2.19 Which of the following structure says that nothing is implemented in kernel space.
(*a*) Monolithic (*b*) Microkernel
(*c*) Layered (*d*) Exokernel.

2.20 Which approach is useful if more processes are executing in a system simultaneously
(*a*) Monolithic (*b*) Microkernel
(*c*) Virtual machine (*d*) Exokernel.