

Assignment no. 1

1) Explain Operating System. What are the goals of operating system?

→ 1) Operating System:-

Operating System is a program that acts as an intermediary between users of a computer and the computer hardware.

2) It is an control program which controls execution of program to prevent errors and improper use of the computer.

3) OS is a resource allocator which manage all the resources and decides between conflicting requests for efficient and fair resources use of computer.

4) Operating System Goals:-

- Execute user programs and makes problem solving easier.

- Make a computer system convenient to use.

- Use computer hardware in efficient manner.

- manage the resources of computer system.

- To hide the details of hardware resources from the users.

5) Explain the structure of computer system?

→ Computer system can be divided into four components:-

(I) Hardware:- provides basic computing resources - CPU, memory, I/O devices.

(II) Operating system:-

Controls and co-ordinates use of hardware among various application & users.

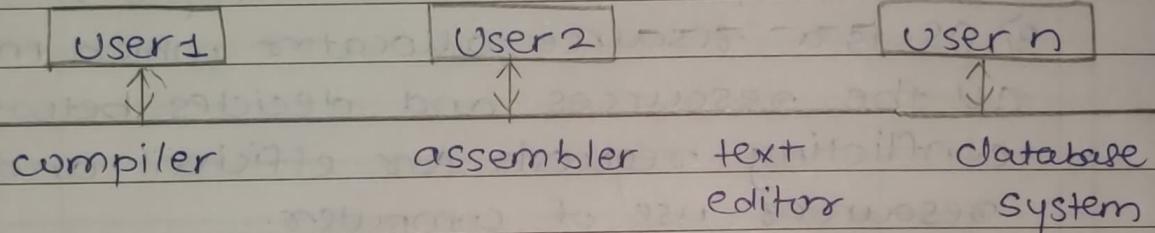
(III) Application programs :-

Defines the ways in which the system resources are used to solve the computing problems of the users.

Ex. Word processors, web browsers, database systems, video games.

(IV) Users :-

People, machines, other computers.



system and application programs

Operating System

Computer hardware

3) What are components of computer system?

→ 1) Hardware :- provides basic computing resources.

Ex. CPU, Pointer, memory devices.

2) Operating System :-

control & coordinate between computers application & user.

3) Application Program :-

Defines the ways in which the

Systems resource are used to solve the computing problem of user.

4) Users :- i) people.

ii) machines.

iii) other computers.

Q. 4) What is Bootstrap program?

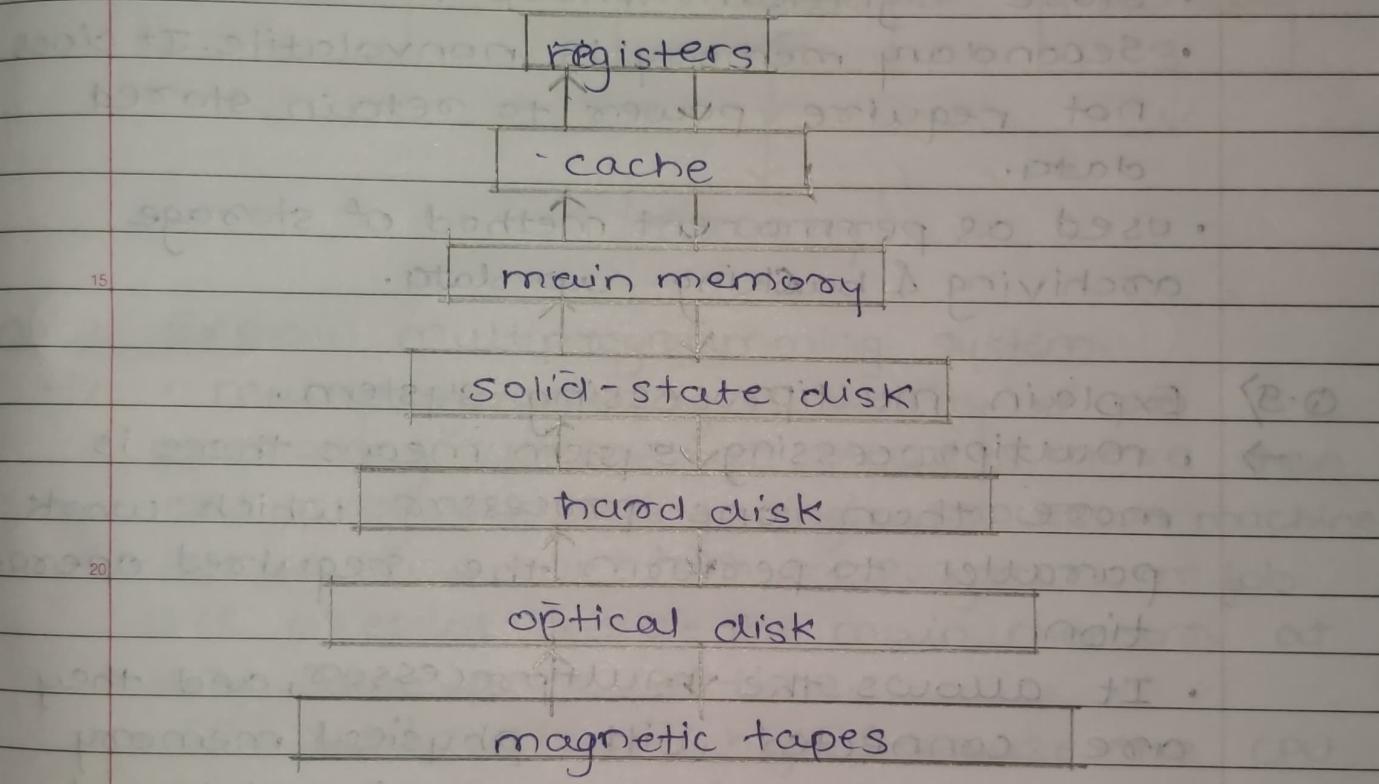
- . Bootstrap program is loaded at power-up or reboot.
- Typically stored in ROM, generally known as firmware.
- Initializes all aspects of system.
- Loads operating system kernel and starts execution.

Q. 5) What is Interrupt? What is difference between Software Interrupt & Hardware Interrupt?

- . Interrupt transfers control to the interrupt service routine generally, through the interrupt vector, which contains the addresses of all the service routines.
- Interrupt architecture must save the address of the interrupted instruction.
- A trap or exception is a software-generated interrupt caused either by an error or a user request.
- An operating system is interrupt driven.
- Difference between Software Interrupt & Hardware Interrupt :-

Software Interrupt	Hardware Interrupt
1) Software Interrupt is an interrupt that is generated by any internal system of computers.	1) Hardware interrupt is an interrupt generated by from an external device/hardware.
2) It increments the program counter.	2) It does not increment the program counter.
3) Software Interrupt can be invoked with the help of INT instruction.	3) Hardware Interrupt can be invoked with some external devices such as request to start an I/O or occurrence of hardware failure.
4) It has highest priority.	4) It has lowest priority.
5) Ex. Password	5) Ex. Pointer
Q.6) Explain storage structure.	
→ main memory :- only large storage media that the CPU can access directly.	
Ex. RAM.	
• Secondary storage :- extension of main memory that provides large nonvolatile storage capacity.	
• Hard disks :- Rigid metal or glass platters covered with magnetic recording material.	

- a) Disk surface is logically divided into tracks, which are subdivided into sectors.
- b) The disk controller determines the logical interaction between device and the computer.
- Solid state disks :- faster than harddisks, nonvolatile.
 - a) Various technologies.
 - b) Becoming more popular.



Q7) Define caching.

- Caching is an important principle, performed at many levels in a computer. (in hardware, operating system, software).
- In caching,
- Copying information from slower to faster storage system is known as caching.

Q.8) What is the advantage of secondary memory over primary memory?

- • Free up capacity on primary storage :-
Storage infrequently accessed data on secondary storage devices frees up space in primary storage & increase performance.
- Secondary storage is usually twice cheaper compared to its primary counterpart.
- Store significant more information.
- Secondary memory is nonvolatile. It does not require power to retain stored data.
- used as permanent method of storage archiving & backing up data.

Q.9) Explain multiprocessor system.

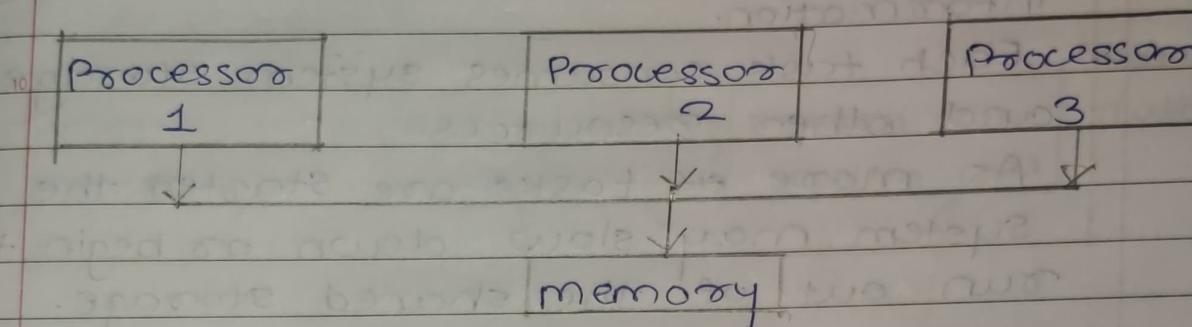
- • Multiprocessor system means there is more than one processor which work parallel to perform the required operation.
- It allows the multiprocessors, and they are connected with physical memory computer buses, clocks and peripheral devices.
- Advantages of multiprocessor systems-
 - 1) If there are multiple processors working at the same time more processes can be executed parallel at same time.
 - 2) Multiprocessor systems are more reliable.

3) Electricity consumption of multiprocessing system is less than the single processor system.

Types of Multiprocessing System:-

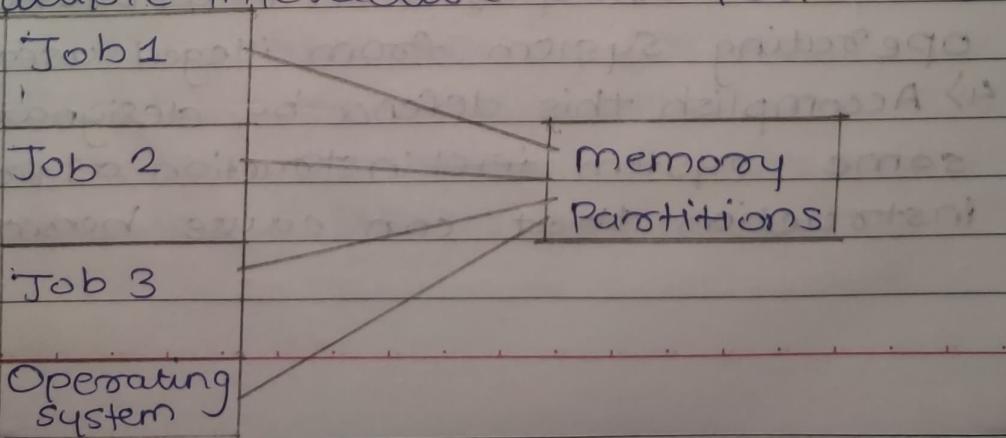
1) Asymmetric :- Each processor is assigned to specific task.

2) Symmetric :- Each processor performs all tasks.



Q10) Explain multiprogramming system.

- multiprogramming is ability of an operating system that executes more than one program using single processor machine.
- more than one task or program or job are present inside the main memory at one time point of time.
- CPU utilization is high because the CPU is never goes to idle state.
- Memory utilization is efficient.
- CPU throughout is high and also supports multiple interactive user terminals.



Q.11) Explain multitasking system?

- Multitasking in an operating system is allowing user to perform more than one computer task at the time.
- Operating system is able to keep track of where you are in the tasks and go from one to the other without losing information.
- Each task consumes system storage and other resources.
- As more tasks are started the system may slow down or begin to run out of the shared storage.

Word

Web browser

E-mail

process

Process

process

Operating System

CPU

Q.12) Explain dual mode operation in OS.

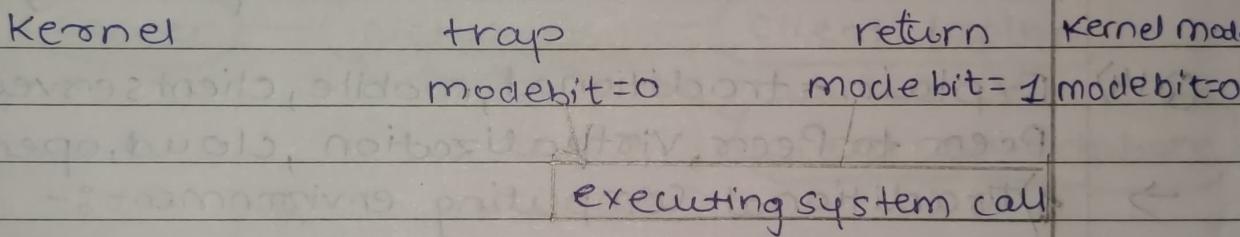
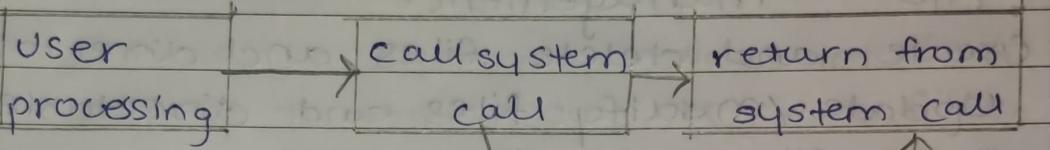
- - 1) multichip & multicore.
 - 2) System containing all chips.
 - 3) Dual mode operation in OS protect the operating system from illegal users.
 - 4) Accomplish this defence by designating some system instruction as privileged instruction that can cause harm.

- The hardware only allows for the execution of privileged instruction in kernel mode.

- Types of dual mode :-

- User mode = 1
- Kernel mode = 0

User processor



Q.13) What are functions performed by operating system?

→ *Functions of operating system :-

- Process management:-

- A process is a program in execution. It is a unit of work within the system.
- Creating and deleting process.
- Process synchronization.
- Deadlock handling.
- Suspend & Resume process.

• Memory management :-

- Keeping track of which part of memory are currently being used and by whom.
- Deciding which process data to move into and out of memory.
- Allocating and deallocating space as needed.

• File management :-

- Create and delete files and directories.
- Update / modify files and directories.
- Save file and directories.
- move file and directories.
- Backup files into secondary storage.

Q14) Explain - traditional, mobile, client server, Peer to Peer, virtualization, cloud, open source.

→ 1) Traditional computing environment :-

- It has stand alone general purpose machines.
- Portals provides web access to internal systems.
- mobile computers interconnect via wireless networks.
- Home systems use firewalls to protect home computers from Internet attacks.

2) mobile computing environment :-

- Handheld smartphones, tablets, etc.
- It has more OS features like GPS, gyroscope.
- Allows new type of apps like augmented

reality.

- Leaders are Apple iOS and Google Android.

3) Client-Server Computing environments :-

- Many systems i.e. servers, responds to requests generated by clients.
- Computer-server system provides an interface to client to request services i.e., database.
- File-server system provides interface for clients to store and retrieve files.

8 Client desktop

15 Server

Network

Client laptop

client us smartphone

20 4) Peer-to-Peer Network Computing environment

- P2P does not distinguish clients and servers.
- Instead all the nodes are considered peers.
- Node must join P2P network.
- Ex. Napster, Skype.

client

client

client

client

client

5) Virtualization Computing Environment :-

- Allows operating systems to run applications within other OSes.
- OS natively compiled for CPU, running guest OSes also natively compiled.
- Emulation is used when source CPU type is different from target type.

6) Cloud Computing environment :-

- Delivers computing, storage, even apps as a service across a network.
- Logical extension of virtualization because it uses virtualization as the base for functionality.

• Types :-

- a) Public cloud :- available via internet to anyone willing to pay.
- b) Private cloud :- run by a company for company's own use.
- c) Hybrid cloud :- includes both public and private cloud components.

7) Open Source Operating System :-

- In this, Operating systems are made available in source-code format rather than just binary closed-source.
- Counter to the copy protection and digital rights management (DRM) movement.
- Ex. Linux and Unix (including core version of Mac OS X), etc.