What is an Operating System?

1. A program that acts as an intermediary between a user of a computer & the computer hardware.
2. Example :- Windows 10, Windows 8, Apple's mac OS & Linux.

Q2 Operating System goals.

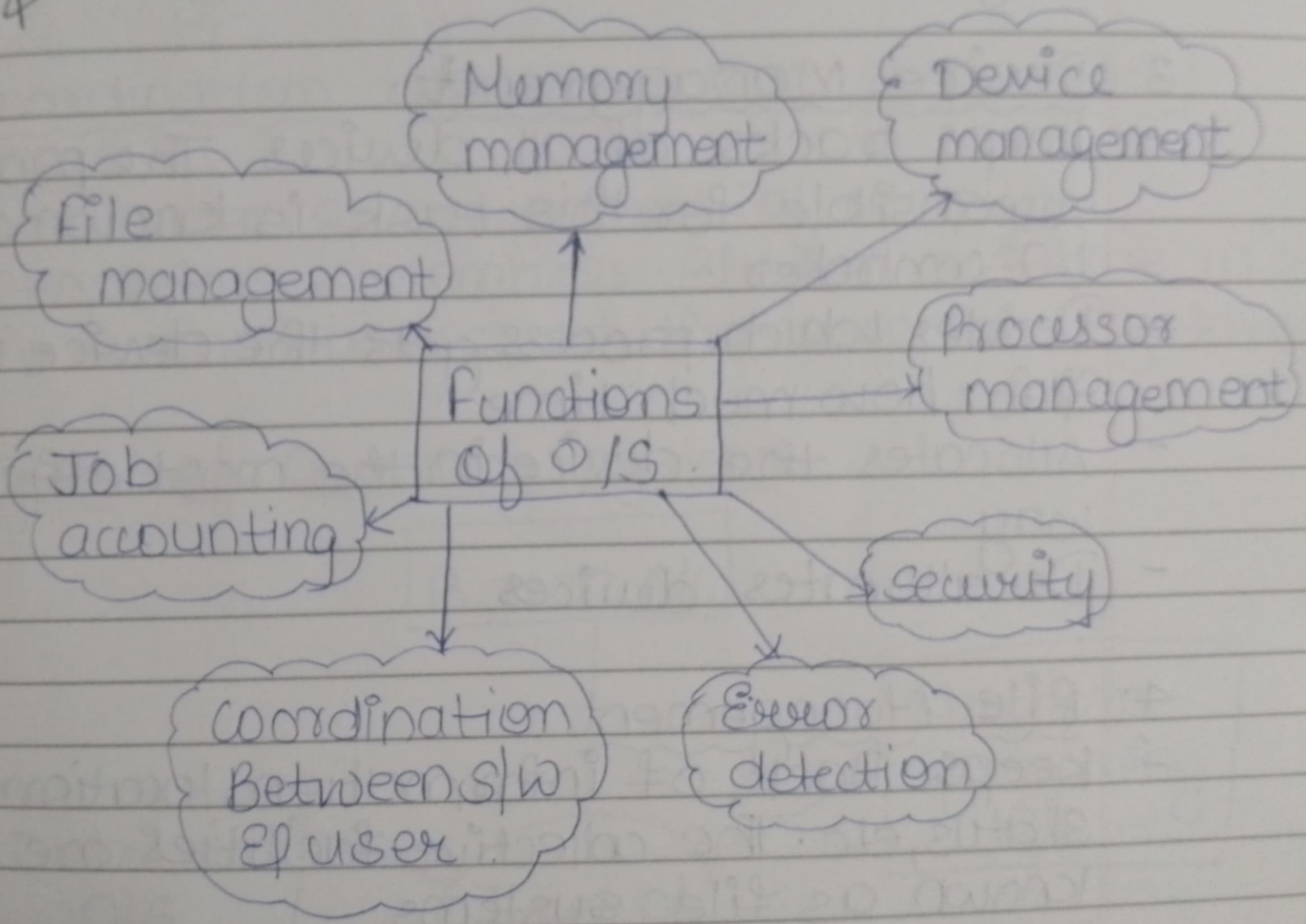
1. Execute user programs & make solving user problems easier.
2. Make the computer system convenient to use.
3. Use the computer hardware in an efficient manner.

Q3

Computer System Components

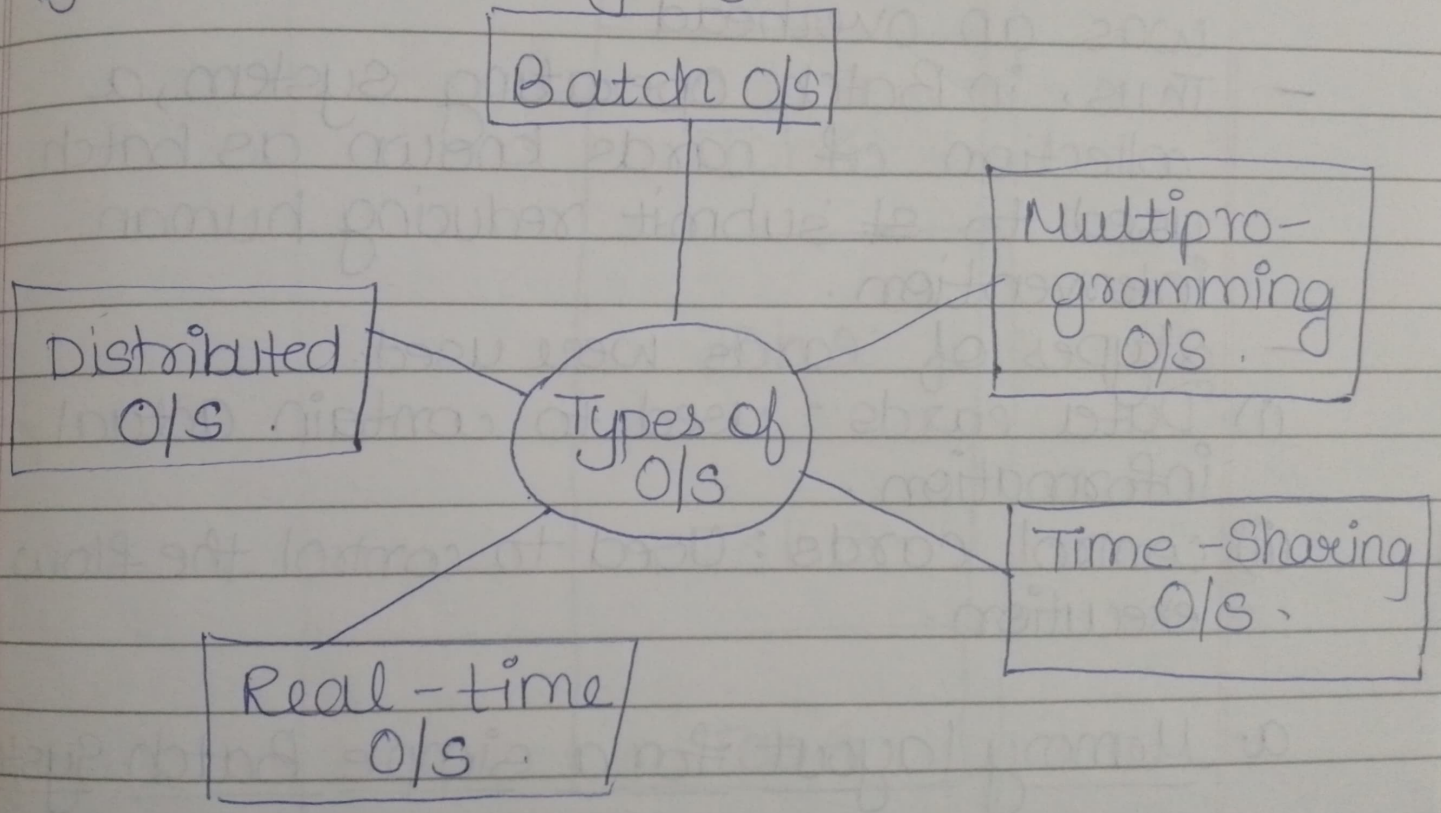
1. Hardware - provides basic computing resources (CPU, memory, I/O devices).
2. Operating system - controls & coordinates the use of the hardware among the various application programs for the various users.
3. Applications programs - define the ways in which the system resources are used to solve the computing problems of the user (compilers, database systems, video games, business programs.
4. Users (people, machines, other computers).

Q4


Memory management
Device management
File management
Processor management
Functions of O/S
Job accounting
Security
Coordination Between S/W & user
Error detection

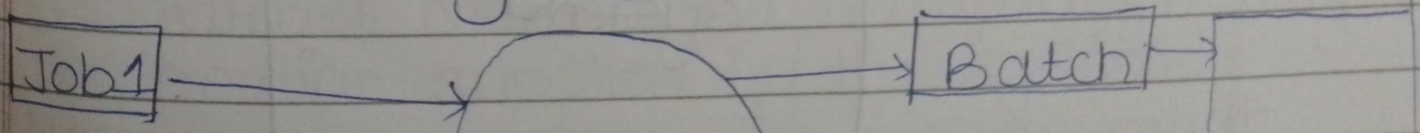
computers' systems.

1. Types of Operating systems.



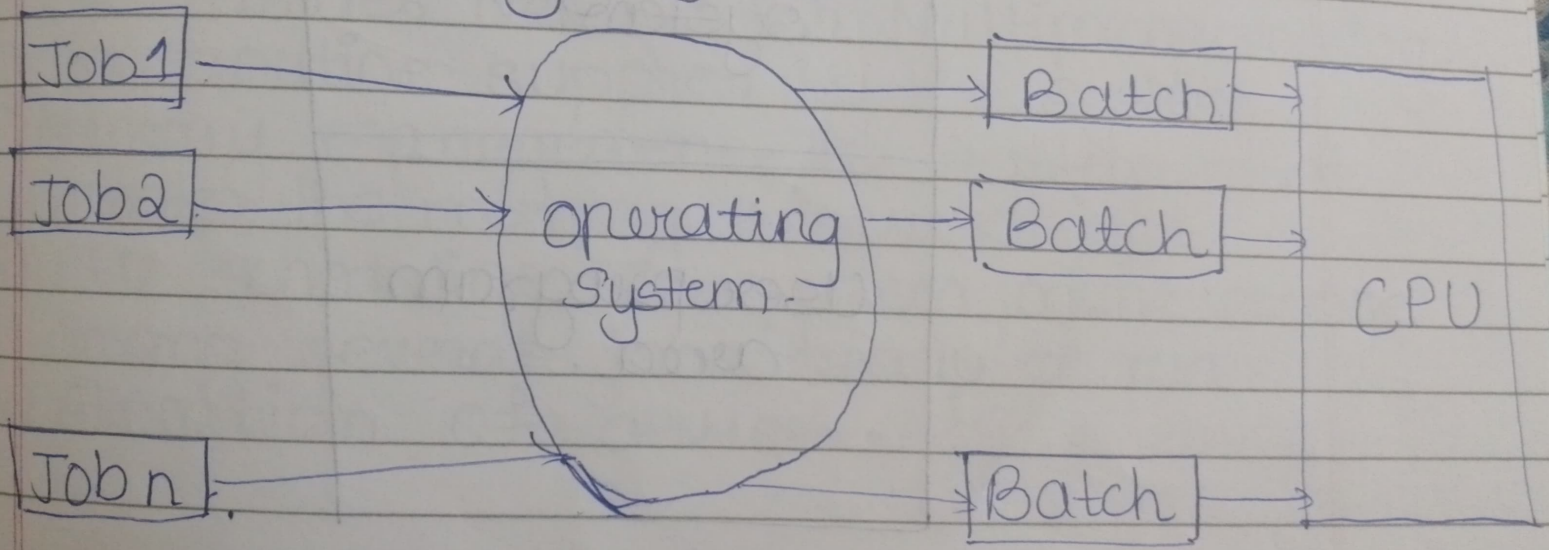
Q7

1. Batch Operating System.



Q7

1. Batch Operating System:



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- (i) This type of operating system does not interact with the computer directly.
(ii) There is an operator which takes similar jobs having same requirement & group them into batches.
(iii) It is the responsibility of operator to sort the jobs with similar needs.
- In a punch card system, human intervention was required for each punch card, which was an overhead.
- Thus, in Batch operating system, a collection of cards known as batch used to submit reducing human intervention.
- 2 types of cards were used.
(i) Data cards: used to contain actual information.
(ii) control cards: used to control the flow of execution.

Q

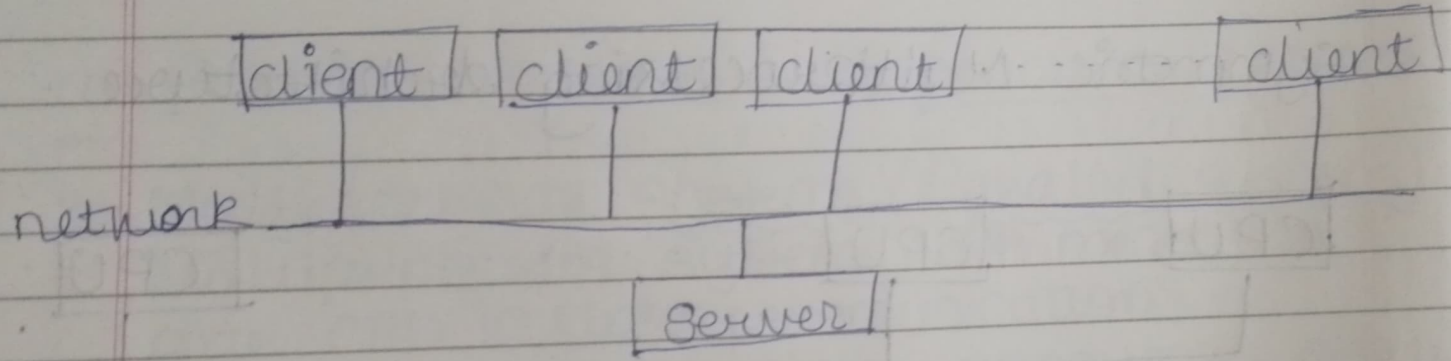
Distributed Systems:

- Distribute the ~~cop~~ computation among several physical processors.
- loosely ~~cop~~ coupled system - each processor has its own local memory; processor communicate with one another through various communications lines, such as high-speed buses or telephone lines.
- Advantages of distributed systems:

(i) Resources sharing.
(ii) Computation speed up - load sharing.
(iii) Reliability
(iv) Communications.

- Requires networking infrastructure.
- Local area networks (LAN) or wide area networks (WAN).
- May be either client-server or peer-to-peer systems.

a. General structure of client-server.



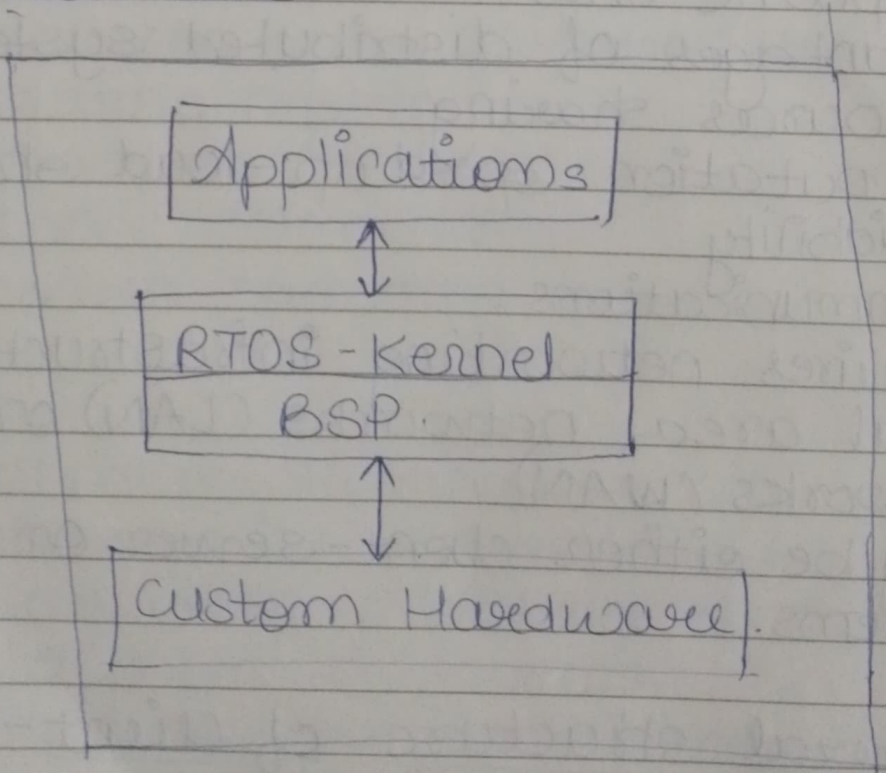
Q9 Real-Time Systems

Q9

5. Real-Time Systems.

- Often used as a control device in a dedicated application such as controlling scientific experiments, medical imaging systems, industrial control systems, & some display systems.
- Well-defined fixed-time constraints.
- Real-Time systems may be either hard or soft real-time.

a) Hard real-time.



a) Hard real-time.
- secondary storage limited or absent, data stored in short term memory, or read-only memory (ROM).
- conflicts with time-sharing systems, not supported by general-purpose operating systems.

b) Soft real-time.
- limited utility in industrial control of robotics.
- useful in applications (multimedia, virtual reality) requiring advanced operating-system features.

Q11

6. Mobile Operating System.

- A mobile OS is a software that allows smartphones, tablet PCs & other hand held devices to run applications & programs.
- Common mobile O/S.

(i) Android
(ii) IOS
(iii) windows
(iv) KaiOS.

- Disk scheduling.

10

Extra (Unit 1)

→ Difference between GUI & CLI

CLI	GUI
1) Stands for Command line interface.	Stands for Graphical user interface.
2) It permits the user to interact with system using commands.	It permits the user to interact with system using graphical controls.
3) It is fast	It is slow.
4) Not much flexible	More flexible
5) User should have good knowledge of commands.	Even a beginner can easily handle.

UNIT 1

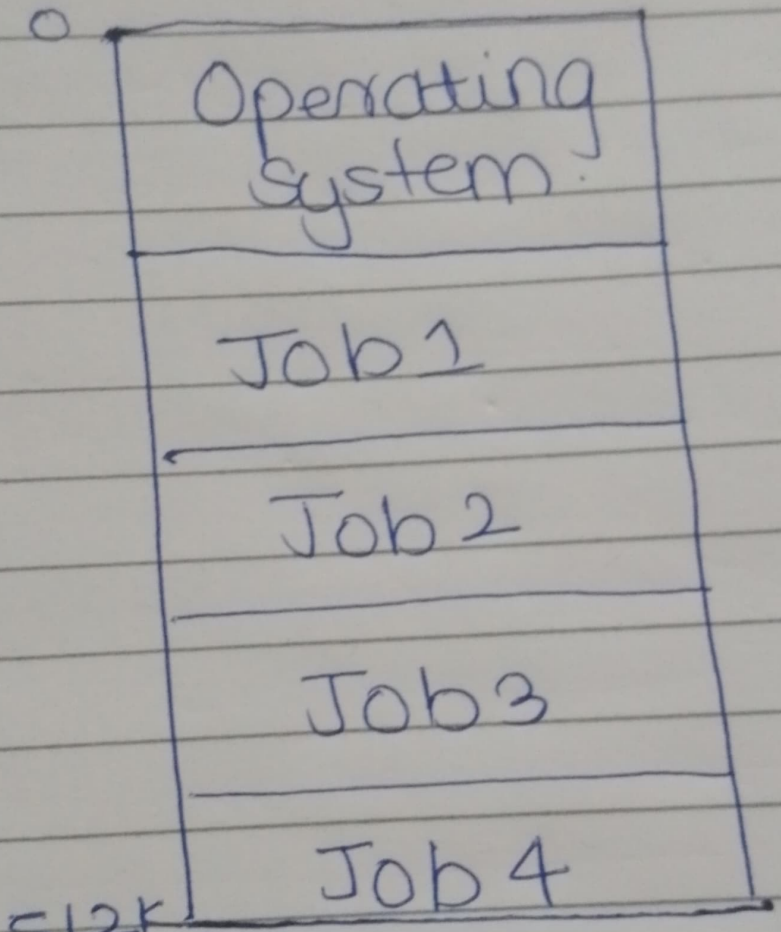
→ Multiprogrammed operating system.

① Multi-programmed operating system allows multiple programs to run concurrently by sharing the CPU.

② It improves CPU utilization & overall system efficiency.

③ It's like having multiple people working on different task at the same time, making the most of the available resources.

④ Several jobs are kept in the main memory at the same time & the CPU is multiplexed among them.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Operating System
Job 1
Job 2
Job 3
Job 4
512K