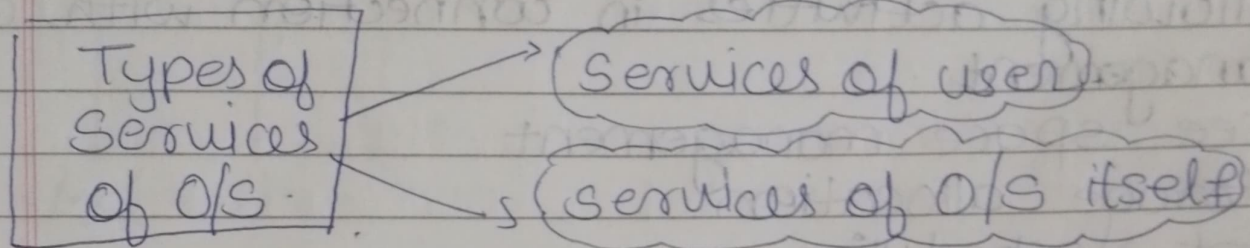


Q1

Two types of services of O/S.



### 1) Services of user

- (a) Operating System provide various services for the users such as GUI for easy interaction, file management, process management & network connectivity.
- (b) These services aim to enhance user's experience & make it easier to perform task on the computers.

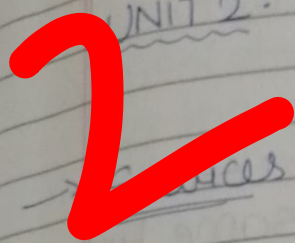
### 2) Services of O/S itself

- (a) Operating System provide services for themselves to ensure smooth functioning & efficient resource management.
- (b) These services include process scheduling, memory management, device management.

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File system management & security services

## UNIT 2: SERVICES & COMPONENTS OF OPERATING SYSTEM



### Services of OS

#### \* Services for the user

- Program execution:  
System capability to load a program into memory & to run it.
- I/O operations:  
Since user programs cannot execute I/O operation directly, the operating system must provide some means to perform I/O.
- File-system manipulation:  
Program capability to read, write, create & delete files.
- Communications:  
Exchange of information between processes executing either on the same computer or on different systems tied together by a network. Implemented via shared memory or messaging passing.
- Error detection:  
Ensure correct computing by detecting errors in the CPU & memory hardware, in I/O devices, or in user programs.



Q2(ii)

\* Services of OS itself.

- Resource allocation :  
Allocating resources to multiple users or multiple jobs running at the same time.
- Accounting :  
Keep track of & record which users use how much & what kinds of computer resources for account billing or for accumulating usage statistics.

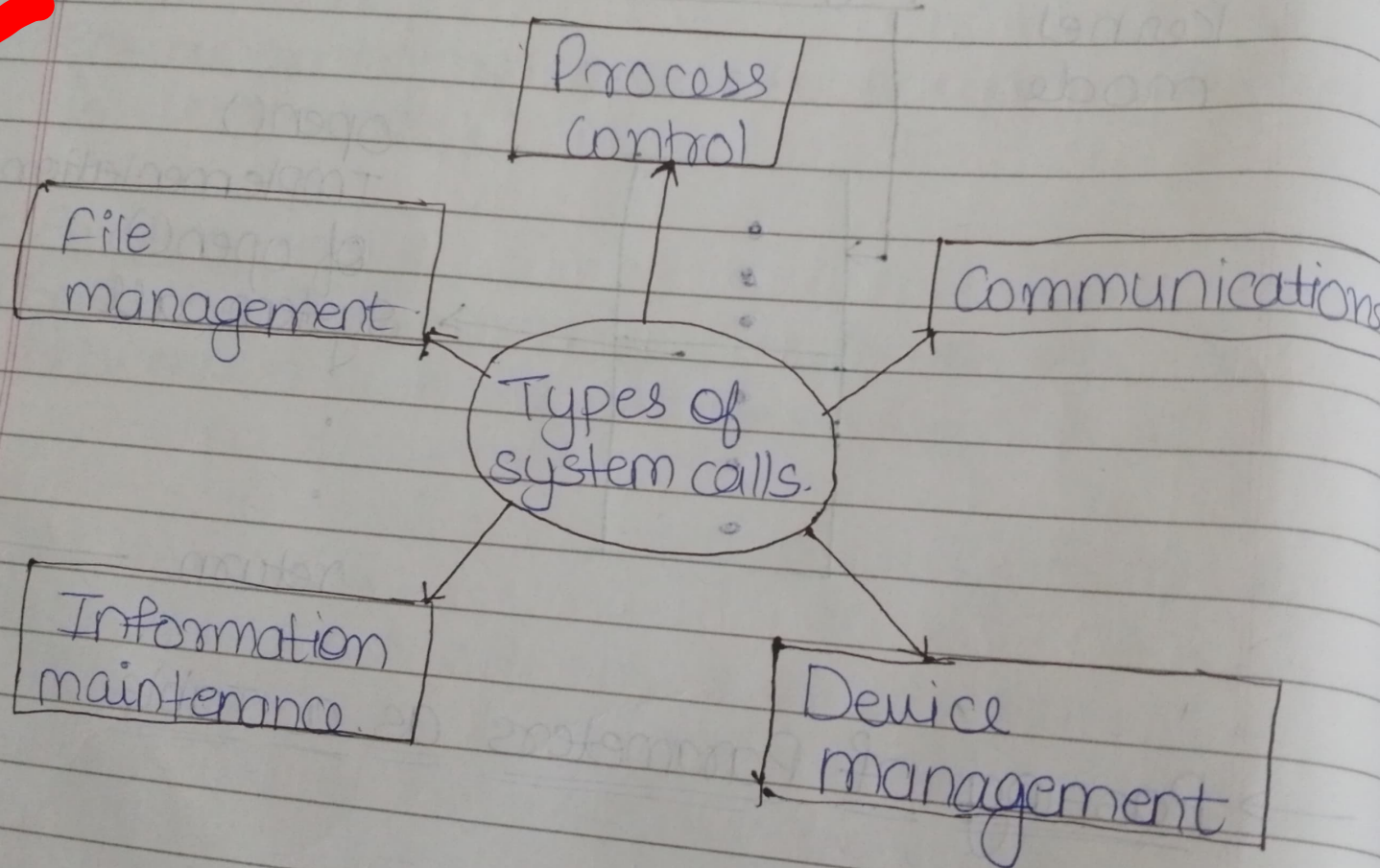
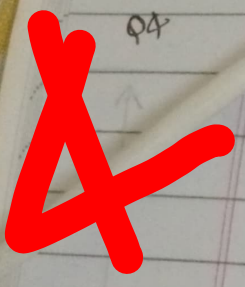
- Protection :  
Ensuring that all access to system resources is controlled.

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user program

Operating System

Q4 → Types of System calls.





Q5.1) Main memory management  
Memory is a large array of words or bytes, each with its own address. It is a repository of quickly accessible data shared by the CPU & I/O devices.

- Main memory is volatile storage device. It loses its contents in the case of system failure.
- The operating system is responsible for the following activities in connections with memory management:
  - Keep track of which parts of memory are currently being used & by whom.
  - Decide which processes to load when memory spaces becomes available.
  - Allocate & deallocate memory space as needed.

# 3.2

## NOTES.

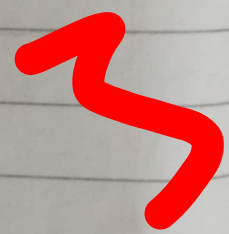
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### → File management

- A file is a collection of related information defined by its creator. Commonly, files represent programs (both source & object forms) & data.
- The operating system is responsible for the following activities in connections with file management.
  - File creation & deletion.
  - Directory creation & deletion.
  - Support of primitives for manipulating files & directories.
  - Mapping files onto secondary storage.
  - File backup on stable (nonvolatile) storage media.



## → Process management

- A process is a program in execution. A process needs certain resources, including CPU time, memory, files, & I/O devices, to accomplish its task.
  - The operating system is responsible for the following activities in connection with process management.
    - Process creation & deletion.
    - Process suspension & resumption.
    - Provision of mechanism for:
      1. Process synchronization.
      2. Process communication.
- 



# 3.4

## NOTES

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### → Secondary storage management

- Since the main memory is volatile & too small to accomodate all data & programs permanently, the computer system must provide secondary storage to backup main memory.
- Most modern computer systems use disks as the principle online storage medium, for both programs & data.
- The operating system is responsible for the following activities in connection with disk management.
  - Free space management.
  - Storage allocation.
  - Disk scheduling.

- System calls related to file management.
- Create file, Delete file.
  - Open a file, close a file.
  - Create directory.
  - Read, write, Reposition.
  - Get file attributes, Set file attributes.
  - Create a link.
  - Change working directory.

6



3

System calls

- System calls provide the interface between a running program & the operating system.
- Generally available as assembly-language ~~for~~ instruction.
- Languages defined to replace assembly-language for systems programming allow system calls to be made directly (eg. C, C++)

2 system calls are:

- 1) "open" - This system call is used to open a file or create a new file.
- 2) "fork" - This system call is used to create a new process, which is like a new instance of a program.