

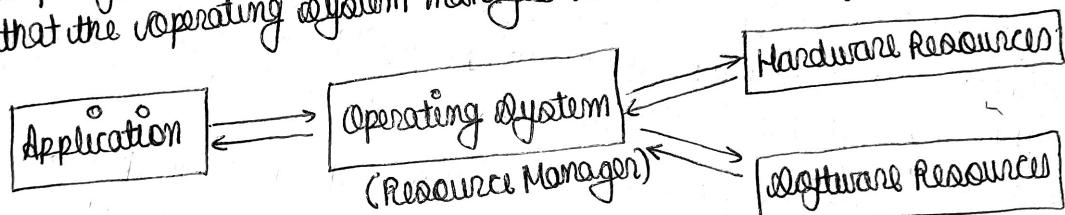
Part A (MCQs)

Assignment 01

- Ques 1 (c) Task control block
- Ques 2 (c) Earliest-deadline-first scheduling
- Ques 3 (b) fast access to specific records in a large file
- Ques 4 (b) It manages and organizes files on secondary storage devices
- Ques 5 (c) It optimizes storage space for different types of files & present data loss in failure
- Ques 6 (c) It doesn't support symbolic links or hard links
- Ques 7 (b) Head crash
- Ques 8 (d) reducing access time and increasing disk bandwidth
- Ques 9 (b) Shortest seek time first
- Ques 10 (d) After servicing the last request in each direction.

Part B (Descriptive Questions)

- Ques 1 An operating system is a software that manages the hardware and software resources of a computer system. It acts as a resource manager by allocating, monitoring, protecting and sharing the resources among the various programs and processes running on the computer. Some of the resources that the operating system manages are CPU, memory, disk and print.



- Ques 2: File attributes include characteristics associated with a file that provide information about its properties. Common file attributes include:

Name: the name of the file.

Type/Extension: type or extension indicates the file format or the type of data stored in a file.

Location: The physical or logical location of the file on the storage.

Size: The size of file in terms of bytes or kilobytes.

Timestamps: Information about when file was created, last modified or last accessed.

Permissions: permissions about who can read, write or execute the file.

Owner: User or entity that owns the file.

File Identifier: A unique identifier to file by the file system.

Ques 3: The first come first serve disk scheduling (FCFS) services the disk I/O requests in the order they arrive. For example
 (Non Preemptive)

anttchart

P ₁	P ₂	P ₃	
0	30	35	40

Process	Arrival Time	Burst Time
P ₁	0	30
P ₂	0	5
P ₃	0	5

Process	Arrival Time	Burst Time	Completion Time	Turnaround Time	Waiting
P ₁	0	30	30	30	0
P ₂	0	5	35	35	30
P ₃	0	5	40	40	35

$$\text{Throughput} = \frac{3}{40}$$

$$\text{average TAT} = \frac{30+35+40}{3} = 35$$

$$\text{average waiting} = \frac{0+35+30}{3} = 21.66$$

Ques 4: The access matrix is a crucial component in protection model and is used to clearly define and manage the permissions and restrictions associated with each subject-object pair. It facilitates the enforcement of security policies by allowing or denying specific operations based on the access rights specified in the matrix. Common terminology of an access matrix are:

① Subjects: Represent entities that can request access

② Objects: Represent resources to which access can be requested.

③ Access Rights: Indicate the specific actions or operations a subject can perform on an object.

Ques 5: Safety control systems are those systems where failure can lead to catastrophic consequences, including the loss of life, significant environmental damage or severe economic impact. Some of the safety critical systems include:

- (i) Aircraft Control Systems, because any failure can lead to disastrous outcome.
- (ii) Medical Devices need run time capabilities to ensure timely responses to changes in patient's condition.
- (iii) Automotive Systems, have very critical Real Time Operating System that are securely used for functions like Anti-lock Braking System, airbag deployment etc.
- (iv) Nuclear Power plant also use safety critical systems to avoid hazards.