

ST. ANN'S COLLEGE OF ENGINEERING & TECHNOLOGY : CHIRALA
DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING
FREQUENTLY ASKED QUESTIONS

Year & Branch: III CSE – I Sem – A

Subject : OPERATING SYSTEMS.

UNIT – 1

1. (a) With the help of a diagram, explain the abstract view of the components of a computer system.
(b) What are the memory devices that can be connected to a computer?
Organize them in a hierarchy.
2. (a) Discuss operating system from user point of view and system view
(b) Compare the computer systems based on the number of processors.
3. (a) What is the difference between symmetric and asymmetric multiprocessing.
(b) How multiprogramming improves CPU utilization.
4. (a) What is Dual mode operation of operating system?
(b) How Caching improves performance of a system. .
5. (a) Define an operating system. What is its purpose? Explain the various functions of an operating system.
(b) What is the dual mode of operation for protecting an operating system? How the hardware support is provided for the dual mode of operation?
6. (a) Explain the terms multiprogramming and multitasking.
(b) Explain the layered approach and microkernel approach to system design.
7. (a) Explain in detail the operating system components.
(b) What is a system call? Explain in brief the types of system calls provided by OS.
8. (a) List and explain the different operating system services.[8]
(b) What is meant by system program? What is the purpose of system programs? [8]
9. (a) Define an operating system. What is its purpose? Explain the various functions of an operating system.
(b) What is meant by system call? Discuss about types of system calls.
10. (a) List and explain the different operating system services.
(b) What is the dual mode of operation for protecting an operating system? How the hardware support is provided for the dual mode of operation?

UNITT -2

1. (a) Explain Priority scheduling with the help of an example. What are Starvation and aging?
(b) What are the situations in which Round robin scheduling is preferred and situations in which it results in overhead.
2. (a) What are the different types of Scheduling Queues? What are the different types of schedulers?
(b) What is the difference between Preemptive and non-preemptive scheduling?
(c) What are the criteria for evaluating scheduling algorithms? Evaluate any onescheduling algorithm using those criteria.
3. (a) What is the difference between process and program? How they are related.
(b) How and what information about a process is represented using PCB.
4. (a) What is system call? What is the difference between system call and system program. What are the different types of system calls?
(b) With the help of a diagram, explain the different states of a process.
5. (a) Describe the differences among short-term, medium-term, and long-term scheduling.
(b) What is a thread? What are the benefits of multithreaded programming?
6. (a) Explain the multithreaded models for user and kernel threads.
(b) What is meant by CPU scheduling? Explain the criteria for comparing CPU scheduling algorithms.
7. List and explain the different CPU scheduling algorithms with example
8. Consider the following set of processes, with the length of the CPU-burst time given in milliseconds:

Process	p1	p2	p3	p4	p5
Burst Time	10	1	2	1	5
Priority	3	1	3	4	2

The processes are assumed to have arrived in the order P1, P2, P3, P4, P5 all at time 0.
9. (a) What is a process? Explain the process states and PCB.
(b) What is a thread? What are the benefits of multi threaded programming?
10. (a) Describe the differences among short-term, medium-term, and longterm scheduling
(b) What is thread? What are the benefits of multithreaded programming?
11. List and explain the different CPU scheduling algorithms with example
12. a) Consider the following set of processes, with the length of the CPU-burst time given in milliseconds:

Process	p1	p2	p3	p4	p5
Burst Time	51	3	1	7	

The processes are assumed to have arrived in the order P1, P2, P3, P4, P5 all at time 0.
 - i) Draw four Gantt charts illustrating the execution of these processes using SJF, and RR (quantum = 1) scheduling.
 - ii) What is the waiting time of each process for each of the scheduling algorithms in part (i)?b) Explain about the interprocess communication

UNIT -3

1. What are the advantages of monitors over semaphores? Solve the Dining philosopher's problem using monitors.
2. What is the difference between binary and counting semaphore. Give a solution for bounded buffer problem.
3. What is Critical Section problem? What are the different solutions to critical section problem?
4. What is the need for Process synchronization? How hardware can be used to solve synchronization problem.
5. What is the critical-section problem? What are the requirements that must be satisfied for its solution?
6. (a) Explain the Readers-Writers problem and give the solution for synchronization using semaphores.
(b) What is meant by a counting semaphore and a binary semaphore? How a counting semaphore is implemented in terms of binary semaphores?
8. (a) What is a semaphore? Discuss its usage, implementation to deal with the n-process critical-section problem.
(b) Explain the synchronization hardware used in solving the critical section problem.
9. What is the critical-section problem? Discuss Peterson's solution.
10. Discuss the hardware based solution for CSP.
11. What is semaphore? What is meant by counting semaphore and binary semaphore?
Discuss mutual exclusion implementation using semaphore.

UNIT-4

1. (a) What is addressing binding? How base and limit registers can be used for address protection.
(b) What is Contiguous memory allocation?
(c) What is Dynamic loading?
2. (a) What is dynamic linking? What is its use?
(b) What is the need for swapping?
(c) What are the different types of fragmentation and what are the solutions for it.
3. Explain the memory management technique Paging.
4. (a) Explain the hardware implementation of the page table.
(b) Explain the segmentation memory management scheme.
5. (a) Explain the difference between external fragmentation and internal fragmentation.
(b) Consider a logical-address space of eight pages of 1024 words each, mapped onto a physical memory of 32 frames. i) How many bits are in the logical address? ii) How many bits are in the physical address?
(c) Given memory partitions of 100 KB, 500 KB, 200 KB, 300 KB, and 600KB (in order), how would each of the first-fit, best-fit, and worst-fit algorithms place processes of 212 KB, 417 KB, 112 KB and 426 KB (in order)? Which algorithm makes the most efficient use of memory?
6. (a) Explain about paging and its implementation.
7. (a) Discuss about the paging hardware with TLB.
(b) Given memory partitions of 500 KB, 100 KB, 200 KB, 300 KB, and 600KB (in order), how would each of the first-fit, best-fit, and worst-fit algorithms place processes of 212 KB, 417 KB, 112 KB and 426 KB (in order)? Which algorithm makes the most efficient use of memory?
8. List and explain the techniques for structuring the page table.
9. (a) What is the need for demand paging.
(b) Illustrate Optimal and LRU page replacement algorithms with the help of an example.
10. What is page fault? Consider the following page-reference string:
1, 2, 3, 4, 2, 1, 5, 6, 2, 1, 2, 3, 7, 6, 3, 2, 1, 2, 3, 6.
11. What is virtual memory? Discuss its benefits.
12. What is page fault? Discuss the following page replacement algorithms.
i) LRU replacement ii) FIFO replacement.

UNIT-5

1. How operating system performs the function of Input and Output.
2. What is Safe state? Write the Bankers algorithm and explain it with the help of an example.
3. (a) What is Resource allocation graph? How Resource allocation graph can be used in the context of Deadlocks.
(b) How Deadlocks can be prevented considering the four necessary conditions.
4. What is Deadlock? What are the necessary conditions for deadlock? What are the overheads associated with Deadlock prevention and Deadlock avoidance algorithms.
5. (a) What is a deadlock? What are the necessary conditions?
(b) Discuss the life cycle of an I/O request.
6. (a) What is deadlock avoidance approach? Explain safe state and unsafe state with example.
(b) Explain the services provided by kernel I/O subsystem.
7. (a) Discuss in detail the resource-allocation graphs with suitable example.
(b) Explain in detail the Banker's algorithms with suitable example.
8. (a) Explain the different options for breaking a deadlock.
(b) Explain in detail the Banker's algorithms with suitable example.
9. (a) What is a deadlock? List the necessary conditions and Explain about resource allocation graph.
(b) Discuss the life cycle of an I/O request.
10. (a) What is safe state and unsafe state? Discuss about the deadlock avoidance.
(b) Explain the services provided by kernel I/O subsystem.
11. (a) Discuss about the deadlock prevention approach.
(b) Explain about the polling and interrupt mechanisms.
12. Give Banker's algorithm and explain with suitable example.

UNIT-6

1. (a) What are the different file attributes and file operations.
(b) What are the different types of files supported by an operating system?
2. Compare sequential and direct access methods.
3. What are the different schemes for logical structure of a directory?
4. What are the different file allocation methods?
5. (a) Explain in detail the NFS protocol.
(b) Explain the on-disk and in-memory structures used to implement a file system.
6. (a) Explain the on-disk and in-memory structures used to implement a file system.
(b) Explain the different methods of maintaining free space list.
7. (a) Explain the following file allocation method
i) Linked allocation ii) Indexed allocation
(b) Explain the different methods of maintaining free space list.
8. (a) Explain the different file access methods.
(b) How do caches help improve performance? Why does system not use more or larger caches if they are so useful?
9. (a) Discuss the file accessing methods.
(b) Explain the techniques used to improve the efficiency and performance of secondary storage.
10. (a) Discuss the schemes for defining logical structure of a directory.
(b) Explain the different methods of maintaining free space list.
11. (a) Explain the concept of file mounting.
(b) Explain the following methods of allocating disk space
1. Linked allocation 2. Indexed allocation
12. (a) Explain the different file access control methods.
(b) Explain about virtual file systems.
13. What are the different types of mass storage structures?
14. What are the different disk scheduling algorithms?
15. (a) How stable storage is implemented.
(b) With the help of a diagram explain the Disk structure.
16. Explain the different RAID levels.