



KINGS

COLLEGE OF ENGINEERING



DEPARTMENT OF INFORMATION TECHNOLOGY

QUESTION BANK

Year /Sem : II / IV
Sub.Code/Sub.Name : CS1253 / OPERATING SYSTEMS

UNIT – 1
PROCESSES AND THREADS
PART – A (2 MARKS)

1. What is an operating system?
2. Differentiate between tightly coupled systems and loosely coupled systems.
3. What is the kernel?
4. What are batch systems?
5. What are privileged instructions?
6. What do you mean by system calls?
7. What is a process?
8. What is process control block?
9. What are schedulers?
10. What are the use of job queues, ready queues and device queues?
11. What is meant by context switch?
12. What is independent process?
13. What is co-operative process?
14. What are the benefits OS co-operating processes?
15. How can a user program disturb the normal operation of the system?
16. State the advantage of multiprocessor system?
17. What is the use of inter process communication.
18. What is a thread?
19. What are the benefits of multithreaded programming?
20. Compare user threads and kernel threads.
21. What is the use of fork and exec system calls?

22. Define thread cancellation & target thread.
23. What are the different ways in which a thread can be cancelled?
24. What is a process state and mention the various states of a process?
25. What is meant by client-server model?

PART - B (16 MARKS)

1. Write about the various system calls. (16)
2. Discuss briefly the various issues involved in implementing Inter Process Communication. (16)
3. Explain in detail about an overview of threads. (16)
4. Explain in detail about the threading issues and types of threads. (16)
5. Discuss the process Concept, process Scheduling and Cooperating Processes. (16)

UNIT- 2

PROCESS SCHEDULING AND SYNCHRONIZATION

PART – A (2 MARKS)

1. Define CPU scheduling.
2. What is preemptive and no preemptive scheduling?
3. What is a Dispatcher?
4. What is dispatch latency?
5. What are the various scheduling criteria for CPU scheduling?
6. Define throughput?
7. What is turnaround time?
8. Define race condition.
9. What is critical section problem?
10. What are the requirements that a solution to the critical section problem must satisfy?
11. Define entry section and exit section.

12. Give two hardware instructions and their definitions which can be used for implementing mutual exclusion.

- TestAndSet

```
boolean TestAndSet (boolean &target)
{
    boolean rv = target;
    target = true;
    return rv;
}
```

- Swap

```
void Swap (boolean &a, boolean &b)
{
    boolean temp = a;
    a = b;
    b = temp;
}
```

13. What is semaphores?

14. Define busy waiting and spin lock.

15. Define deadlock.

16. What is the sequence in which resources may be utilized?

17. What are conditions under which a deadlock situation may arise?

18. What is a resource-allocation graph?

19. Define request edge and assignment edge.

20. What are the methods for handling deadlocks?

21. Define deadlock prevention.

22. Define deadlock avoidance.

23. What are a safe state and an unsafe state?

24. What is banker's algorithm?

PART- B(16 MARKS)

1. Write about the various CPU scheduling algorithms. (16)

2. Consider the following set of processes, with the length of the CPU-burst time in given ms (16)

Process	Burst Time	Priority
P1	10	3
P2	1	1
P3	2	3
P4	1	4
P5	5	2

The processes are assumed to have arrived in the order P1, P2, P3, P4,P5 all at time 0.

- Draw four Gants charts illustrating the execution of these process using FCFS,SJF,a non preemptive priority(a smaller priority number implies a higher priority) ,and RR(quantum=1)scheduling. (04)
 - What is the turn around time of each process for each of the scheduling algorithms in part a? (04)
 - What is the waiting time of each process for each of the scheduling algorithms in part a? (04)
 - Which of the schedules in part a result in the minimal average waiting time(over all process)? (04)
- Write notes about multiple-processor scheduling and real-time scheduling. (16)
 - What is critical section problem and explain two process solutions multiple process solutions? (16)
 - Explain what semaphores are, their usage, implementation given to avoid busy waiting and binary semaphores. (16)
 - Explain the classic problems of synchronization. (16)
 - Write about critical regions and monitors. (16)
 - Give a detailed description about deadlocks and its characterization. (16)
 - Explain about the methods used to prevent deadlocks. (16)
 - Write in detail about deadlock avoidance. (16)

11. Explain the Banker's algorithm for deadlock avoidance. (16)
12. Give an account about deadlock detection.
13. What are the methods involved in recovery from deadlocks? (16)

UNIT – 3

STORAGE MANAGEMENT

PART – A (2 MARKS)

1. Define logical address and physical address.
2. What is logical address space and physical address space?
3. What is the main function of the memory-management unit?
4. Define dynamic loading.
5. Define dynamic linking.
6. What are overlays?
7. Define swapping.
8. What are the common strategies to select a free hole from a set of available holes?
9. What do you mean by best fit?
10. What do you mean by first fit?
11. What is virtual memory?
12. What is Demand paging?
13. Define lazy swapper.
14. What is a pure demand paging?
15. Define effective access time.
16. Define secondary memory.
17. What is the basic approach of page replacement?
18. What are the various page replacement algorithms used for page replacement?
19. What are the major problems to implement demand paging?
20. What is a reference string?
21. Define virtual memory

PART-B (16 MARKS)

1. Explain about contiguous memory allocation. (16)

2. Give the basic concepts about paging. (16)
3. Write about the techniques for structuring the page table. (16)
4. Explain the basic concepts of segmentation. (16)
5. What is demand paging and what is its use? (16)
6. Explain the various page replacement strategies. (16)
7. What is thrashing and explain the methods to avoid thrashing? (16)
8. What is meant by virtual memory? Give some major benefits which are making applicable. (16)
9. Consider the following page reference string.
1,2,7,8,3,4,2,1,4,2,5,6. How many page fault would occur for the following page replacements algorithms, assuming an allocation of 3 frames? (16)
 - (i)LRU
 - (ii)FIFO
 - (iii)Optimal
10. a) Explain about implementation details for file and directory. (08)
 - b) Given memory partitions of 100k,500k,200k,300k and 600k(in order) how would each of the first fit, best fit and worst fit algorithm place process of 412k,317k,112k and 326k(in order)? (08)
11. Given a memory partitions of 100KB,500KB,200KB,300KB and 600KB(in order), how would each of the first fit, best fit, worst fit algorithms place processes of 212KB,417KB,112KB and 426KB(in order)? Which algorithm makes the most efficient use of memory? (16)

UNIT- 4

FILE SYSTEMS

PART – A (2 MARKS)

1. What is a file?
2. List the various file attributes.
3. What are the various file operations?
4. What are the information associated with an open file?

5. What are the different accessing methods of a file?
6. What is Directory?
7. What are the operations that can be performed on a directory?
8. What are the most common schemes for defining the logical structure of a directory?
9. Define UFD and MFD.
10. What is a path name?
11. What are the various layers of a file system?
12. What are the structures used in file-system implementation?
13. What are the functions of virtual file system (VFS)?
14. Why is the production needed in file sharing system?
15. List the features of Linux system
16. Briefly discuss the relative advantages and disadvantages of sector sparing and sector slipping.
17. What is meant by OS platform independent?
18. Write about windows2000 file protection and security services.
19. Define LDAP

PART-B (16 MARKS)

1. What are files and explain the access methods for files? (16)
2. Explain the schemes for defining the logical structure of a directory. (16)
3. Write notes about the protection strategies provided for files. (16)
4. What are the file allocation methods and explain it. (16)
5. Explain about the free space management. (16)
6. Explain the schemes for defining the logical structure of a directory. (16)

UNIT – 5

I/O SYSTEMS

PART – A (2 MARKS)

1. Define seek time and latency time.
2. What are the allocation methods of a disk space?
3. What are the advantages of Contiguous allocation?

4. What are the drawbacks of contiguous allocation of disk space?
5. What are the advantages of Linked allocation?
6. What are the disadvantages of linked allocation?
7. What are the advantages of Indexed allocation?
8. How can the index blocks be implemented in the indexed allocation scheme?
9. Define rotational latency and disk bandwidth.
10. How free-space is managed using bit vector implementation?
11. Define buffering.
12. Define caching.
13. Define spooling.
14. What are the various disk-scheduling algorithms?
15. What is low-level formatting?
16. What is the use of boot block?
17. What is sector sparing?

PART-B (16 MARKS)

1. Write about the kernel I/O subsystem. (16)
2. Explain the various disk scheduling techniques. (16)
3. Write notes about disk management and swap-space management. (16)
4. What is mean by RAID and explain it in detail. (16)
5. Discuss about stable and tertiary storages. (16)