MCA/D-16
OPERATING SYSTEM
PAPER-MCA-14-35

Time Allowed: 3 Hours   Maximum Marks: 80

Note: Attempt five questions in all. Question No. 1 is compulsory. All questions carry equal marks.

Compulsory Question

1. (a) Differentiate between long, medium and short-term process scheduling.
   (b) What is the purpose of system programs?
   (c) What are the necessary conditions for occurrence of a deadlock?
   (d) What is starvation? Discuss.
   (e) Discuss the role of PTBR and PTLR in implementation of paging.
   (f) What are the benefits of a distributed file system when compared to a file system in a centralized system?

Unit-I

2. (a) What are special purpose systems? Also discuss the functions of an operating system?
   (b) What is the use of Process Control Block (PCB)? Discuss the contents of PCB.

3. (a) Discuss Priority scheduling and Multi-level queue scheduling. Also point out their benefits and drawbacks.
   (b) What is the need of a system call? With the help of an example, explain how it is executed

Unit-II

4. (a) What is a semaphore? What are the problems in initial implementation of a semaphore? How do you modify it?
   (b) What is critical section? Explain the algorithms for solving critical section problem for two processes.

5. What is the difference between deadlock avoidance and detection? Discuss deadlock detection algorithm for single instance and multiple instances of resource type?

Unit-III

6. (a) How can we implement segmentation with paging? Explain with suitable diagram and example.

(b) What do you mean by Demand Paging? Explain various steps to handle a page fault. How can we evaluate the performance of Demand Paging? Explain with examples.

6. Suppose a disk drive has 200 cylinders, numbered 0 to 199. The drive is currently serving a request at cylinder 53, and the pervious request was at cylinder 12. The queue of pending requests, in FIFO order, is
98, 183, 37, 122, 14, 124, 65, 67
Starting from the current head position, what is the total distance (in cylinder) that the disk arm moves to satisfy all the pending requests for each of the following disk scheduling algorithms?
(i)   FCFS   (II)   SSTF
(iii)   SCAN   (iv)   LOOK
(iv)   C-SCAN   (v)   C-LOOK

Unit-IV

7. What is distributed system? How does distributed operating system differ from a network operating system? Also discuss the basic issues that the designer of a communication network must address in distributed operating system.

9. (a) What is an access matrix? Describe various implementations of access matrix in brief.
   (b) What is the goal of protection? Also describe major principles of protection.