

MCAM(14-15-2021)/D-21**24043****OPERATING SYSTEMS****Paper–MCA-14-15**

Time Allowed : 3 Hours]

[Maximum Marks : 80

Note : Attempt **five** questions in all. Question No. **1** is compulsory. Attempt other four questions selecting **one** question from each Unit. All questions carry equal marks.

Compulsory Question

1. (a) Discuss the functions of Operating systems. 4
- (b) What is critical section? What are the requirements for critical section solution? 4
- (c) Explain different types of file accessing methods. 4
- (d) Compare and contrast the techniques of caching disk blocks locally on a client system and remotely on a server. 4

UNIT–I

2. (a) Discuss the followings : 8
 - (i) Distributed systems
 - (ii) Multiprocessor systems
 - (iii) Open-source operating systems.
- (b) Explain inter-process communication. What are various while designing message-passing system? Discuss. 8
3. Discuss various algorithms for CPU-Scheduling using suitable examples. Also make a comparative study of these algorithms. 16

UNIT–II

4. (a) What is the difference between symmetric and asymmetric solution of dining-philosopher problem using semaphore? Explain. 8
- (b) Explain Readers-Writers problem along with its solution in detail. 8

5. What is Deadlock? How is it different from starvation? Discuss the algorithms to avoid a deadlock using example. 16

UNIT-III

6. (a) How virtual memory is implemented in a Computer system? What costs and benefits are involved in implementing virtual memory? 8
- (b) What is paging? How it can be used to implement segmentation? Explain using diagram and example. 8
7. (a) Discuss the directory structures and directory protection mechanism. 10
- (b) Discuss the following device scheduling algorithms and explain the criteria and situation where they will perform better : 6
- (i) FCFS (ii) C-SCAN (iii) LOOK.

UNIT-IV

8. (a) What are the goals of protection? Also discuss the implementation of access matrix. 8
- (b) What is Security problem? Discuss various program and system threats. 8
9. (a) Discuss the following algorithms for implementing mutual exclusion in distributed environment : 10
- (i) Centralized approach
- (ii) Fully distributed approach
- (iii) Token-passing approach.
- (b) Discuss the fully distributed approach of deadlock detection. 6