Roll No……. **10379**

MCA I D-13

OPERATING SYSTEMS

Paper—MCA-304

Time allowed: 3. hours] [Maximum marks: 80

Note : There are nine questions in this paper. Attempt five questions in all. Question No. 1 is compulsory. Attempt four questions selecting one question from each unit.

1. Compulsory Question

(a) Give major characteristics of operating system as resource manager. 3

(b) What are various types of system calls? 3

(c) Explain the transition of a process from one state to another with the help of diagram. 3

(d) Define context switch. Why is it considered as an overhead? 3

(e) What is fragmentation? Give difference between internal and external fragmentation. 3

(f) Explain MFU page replacement algorithm. 3

(g) Write in brief about device management. 3

(h) What are device scheduling policies? 3

Unit - 1

2. Discuss various types of operating systems with their strengths and limitations. Also give major components of an operating system. 14

3. What are various levels of scheduling ? Explain shortest job first, shortest remaining time first and round robin scheduling algorithms for processes with the help of suitable examples. 14

Unit-11

4. Define critical section problem. How race condition causes critical section problem? Briefly describe the three classical process co—ordination problems and their solutions. 14

5. List Coffman's conditions resulting in deadlocks. How deadlocks can be detected in multi-instance resource scenarios? Also suggest some deadlock recovery mechanisms. 14

Unit-III

6. How segmentation is used for physical and virtual memory management? What are major advantages and disadvantages of using segmentation over paging? 14

What are various structured organizations ‘for directories? How they can be implemented? Give the directory structure of UNIX? 14

Unit—IV

8. Give the comparative overview of DOS, WINDOWS, UNIX and LINUX operating system in terms of various services provided, memory management, process management, advantages and disadvantages. 14

Write a short note on:

(a) Goals of protection 5

(b) Access matrix and its implementation 5

(c) Revocation of access rights. 4