7. (a) What is Dinning Philosopher's problem ? Also provide the correct solution for the same. State the relevance of the same in operating systems.

(b) What is a file-system ? What are the main responsibilities of a file-system ? Where is file-system located in layered organization of operating system ? 8,8

Unit-IV

8. (a) Outline the purpose and syntax of any *two* UNIX commands belonging to the following categories of commands :

(i) Information commands

(ii) Process management

(iii) System administration

(b) What is meant by disk scheduling ? State the desirable characteristics of disk scheduling policies and explain briefly the various seek optimization scheduling policies. 7,9

9. Explain the following :

(a) Mutual Exclusion and its relevance

(b) Race conditions and their avoidance

(c) Shell and its types 6,5,5

Roll No. : .....

Total No. of Questions : **9**] [Total No. of Pages : **4**

67142

M.C.A. (Regular) 3rd Semester (NON CBCS) Examination, March-2021

OPERATING SYSTEMS

Paper-MCA-302

*Time : **Three** Hours]* *[Maximum Marks : **80***

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note :- Question No. **1** is compulsory. Attempt *four* questions by selecting *one* question from each Unit. All questions carry equal marks.

1. (a) What are Process States ?

(b) What is Real-time Scheduling ?

(c) What are Bernstein's Conditions ?

(d) What do you mean by Interrupt Handler ?

(e) What is a Device Controller ?

(f) What is the directory structure of UNIX Operating System ?

(g) What is Fragmentation ? How can it be overcome ? Explain.

(h) What is Critical Section ? 2×8=16

Unit–I

2. (a) What is an operating system ? What are the major functions of an operating system ? Explain.

(b) What is CPU scheduling ? What is a process-scheduler ? Shown below is the workload for 5 jobs arriving at time zero in the order given below :

Job	Routine
1	10
2	29
3	3
4	7
5	12

Now considering FCFS, SJF and Round-Robin (RR) [quantum = 12] algorithms for this set of jobs, find out which algorithm would give the minimum average time and turn-around time. 6,10

3. Explain the following :

(a) Distributed File System

(b) Operating System Services.

(c) Virtual Machines 6,5,5

Unit–II

4. (a) What is a Page ? How is a page size decided ? Justify your answer.

(b) What is PMT ? How physical memory address is determined from effective address ?

(c) What is segmentation ? Discuss its advantages and disadvantages. 6,5,5

5. Explain the following :

(a) Thrashing

(b) Page Replacement Algorithms 6,10

Unit–III

6. (a) Give the general model of a file-system. Explain the function of Access Control Verification (ACV) module of file-system.

(b) What do you mean by 'Semaphore' ? What are the disadvantages of semaphore ? Implement the Producer-Consumer problem using Semaphores. 8,8