

(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

UNIT – IV

8. (a) What is a shell script ? Write a shell script to generate factorial a number. 7
(b) What is Linux ? Chart main features of Linux and outline their significance. 9
9. (a) Outline the purpose and syntax of any two Linux commands belonging to the following categories : 8

- (i) Networking
- (ii) Disk utilities
- (iii) Process management
- (iv) System administration

- (b) Explain the following : 4
- (i) Linux Shell and its types 4
 - (ii) Use of pipes and redirection 4

Roll No.

67058-N

MCA 2nd Semester 2 yr. Course
w. e. f. 2020-21

Examination – July, 2022

OPERATING SYSTEMS & SHELL PROGRAMMING

Paper : 20MCA22C3

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 : Attempt *five* questions in all, Question Number 1 is *compulsory*. In addition to *compulsory* question, student has to attempt *four* more questions selecting *one* question from each Unit.

1. (a) What is Page Fault ? 8 × 2 = 16
(b) What is memory management ?
(c) What are race conditions ?
(d) What is process states diagram ?
(e) What is Critical Section ?

- (f) What is paging ?
- (g) What is the concept of a virtual machine ?
- (h) What are event counters ?

UNIT – I

- 2. (a) How Layered Structure Approach of operating system differs from Kernel Approach ? Explain. 6
- (b) What is an operating system ? Enumerate important characteristics of a good operating system and also discuss the responsibilities of an operating system as a resource manager. 10
- 3. (a) What is a scheduler ? What should be the performance criteria for a scheduler ? Compare and contrast important scheduling techniques. 10
- (b) Explain the following : 6
 - (i) Process States
 - (ii) Operating System Services

UNIT – II

- 4. (a) What is meant by synchronization ? How does the synchronization tools help in offering a correct solution for 'Readers and Writers' problem ? Explain. 8
- (b) What are semaphores ? What are the benefits and limitations of semaphores ? How do semaphores solve the problem of mutual exclusion ? Explain. 8

- 5. Explain the following :
 - (a) Banker's Algorithm
 - (b) Producer Consumer problem and its solution

UNIT – III

- 6. (a) What is fragmentation ? What are different types of fragmentation ? How each of these can be overcome ? Explain. 7
- (b) What is a Swapping System ? Consider a swapping system in which memory of the following hole sizes in memory order : 10K, 4K, 20K, 18K, 7K, 9K, 12K, and 15K. Which hole is taken for successive requests of : 9
 - (i) 12K
 - (ii) 10K
 - (iii) 9K

for First-Fit ? Repeat the same for Best-Fit, Worst-Fit and Next-Fit.

- 7. (a) What is disk scheduling ? State the desirable characteristics of disk scheduling policies and explain briefly the various seek optimization scheduling policies. 8