Unit-IV

8. (a) What are the salient features of UNIX operating system ? Explain. 7

   (b) Differentiate 'Deadlock-Avoidance', 'Deadlock-Prevention' and 'Deadlock-Detection'. What is Banker's algorithm and indicate for which of the above three the same is used ? Illustrate the same through a suitable example. 9

9. (a) What is meant by disk scheduling ? Explain why disk scheduling is necessary ? Enumerate the principal differences among various disk-scheduling techniques. 8

   (b) Give the purpose and syntax of any two UNIX commands belonging to the following categories of commands : 8

   (i) System administration

   (ii) Security and protection

   (iii) Process management

   (iv) Inter-user communication

MCA 3rd Semester (Non CBCS) Examination,

Nov/Dec-2019

OPERATING SYSTEMS

Paper-MCA-302

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

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 Bernstein's Conditions ?

   (b) What should be page size ? Justify your answer.

   (c) What is the directory structure of UNIX operating system ?

   (d) What is process states diagram ?

   (e) What is Critical Section ?

   (f) What is Device Independence ?

   (g) What is Real-time Scheduling ?

   (h) What is an Interrupt Handler ? 2×2=16

Unit-I

2. (a) 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

(b) How Layered Structure Approach of operating system differs from Kernel Approach ? Explain. 6

3 (a) What do you mean by a scheduler ? What should be the performance criteria for a scheduler ? Compare and contrast important scheduling techniques. 10

(b) Differentiate between the following : 6

(i) Multitasking and multithreading

(ii) Time-sharing and Multiprogramming

Unit-II

4. (a) What is memory management ? Discuss objectives of memory management. 6

(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 :

(i) 12K (ii) 10K (iii) 9K

For First-Fit ? Repeat the same for Best-Fit, Worst-Fit, and Next-Fit. 10

5. (a) What is fragmentation ? What are different types of fragmentation ? How each of these can be overcome ? Explain. 7

(b) What is paging ? How address mapping is performed in paging technique ? Also enumerate the advantages and disadvantages of paging. 9

Unit-III

6. (a) Give the general model of a file-system. Explain the function of Access Control Verification (ACV) module of file-system. 7

(b) What is meant by synchronization ? How does the synchronization tools help in offering a correct solution for 'Readers and Writers' problem ? Explain. 9

7. (a) What are semaphores ? What are the benefits and limitations of semaphores ? How does semaphores solve the problem of mutual exclusion? Explain. 8

(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