[Total No. of Questions - 9] [Total No. of Printed Pages - 2]

May-25-0779

CSPC-412 (Operating System) [AI&ML, CSE, AI&DS]

B.Tech. 4th (NEP)

Time : 3 Hours **Max. Marks : 60**

The candidates shall limit their answers precisely within the answer-book (40 pages) issued to them and no supplementary/continuation sheet will be issued.

Note : Attempt one question each from sections A, B, C and D. Section E is Compulsory.

SECTION - A

1. (a) Differentiate between a process and thread. Compare user threads and kernel threads. (6)

   (b) Discuss the essential properties of the following types of systems, (i) Time sharing systems (ii) Multi-processor systems (iii) Distributed systems. (6)

2. (a) What are the different states of a process? Distinguish between CPU bounded, I/O bounded processes. (6)

   (b) Write a note on operating system services. (6)

SECTION - B

3. (a) What are the conditions under which a deadlock situation may arise? Explain. (6)

   (b) State critical section problem. Discuss three solutions to solve the critical section problem. (6)

4. (a) Write about the various CPU scheduling algorithms. (6)

   (b) How can deadlock be detected? Explain. (6)

SECTION - C

5. (a) What are the steps required to handle a page fault in demand paging? Explain. (6)

   (b) What is file? What is directory? Discover the ways to overcome the disadvantages of two level directory. (6)

6. (a) What is the various Page Replacement Algorithms used for Page Replacement? Explain LRU page replacement algorithm with the help of an example. (6)

   (b) What is a file? What are the various file operations? Explain. (6)

SECTION - D

7. (a) Why is rotational latency not considered in disk scheduling? (6)

   (b) What are the allocation methods of a disk space? Explain about free space management with example. (6)

8. (a) Explain about RAID in detail. (6)

   (b) Write a note on network operating system. (6)

SECTION - E (Compulsory)

9. (a) When will page faults occur?

   (b) Why are segmentation and paging sometimes combined into one scheme?

   (c) What is the use of boot block?

   (d) List the functions of Dispatcher Module.

   (e) How will you calculate turn-around time?

   (f) Define busy waiting and Spinlock. (6×2=12)