

B.Sc. Sem.-6 Examination

CC-310

Computer Science

April-2025

Time : 2-30 Hours]

[Max. Marks : 70

Q:1 Write following**[14]**

(a) Explain the evolution and history of operating systems with examples of early systems.

(b) Why is an operating system needed? Describe its functions in detail.

OR

(a) Compare single-user and multi-user operating systems with suitable examples.

(b) Discuss the key elements of an operating system and their roles.

Q:2 Write following**[14]**

(a) What are the primary functions of memory management in an operating system?

(b) Compare contiguous and non-contiguous memory allocation techniques.

OR

(a) Explain the concepts of paging and segmentation with examples.

(b) Describe demand paging. How does it differ from regular paging?

Q:3 Write following**[14]**

(a) Define a process and explain various states of a process with a process state diagram.

(b) What are deadlocks? Explain necessary conditions and methods of deadlock handling.

OR

(a) What is a critical section? Discuss how mutual exclusion is handled.

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- (b) What is the Producer-Consumer Problem? Explain with solution using semaphores.

Q:4 Write following

[14]

- (a) Describe any three CPU scheduling algorithms with suitable examples.
(b) What are the functions of device management in an operating system?

OR

- (a) Explain disk space allocation methods and their advantages/disadvantages.
(b) Discuss different disk scheduling algorithms such as FCFS, SSTF, and SCAN.

Q:5 Attempt any SEVEN

[14]

- 1 OS stands for _____
 - 2 IPC stands for _____
 - 3 The _____ algorithm selects the process with the shortest burst time for execution.
 - 4 In _____ memory allocation, memory is allocated in one continuous block.
 - 5 The _____ problem is a classic example of a multi-process synchronization issue.
 - 6 In paging, memory is divided into fixed-size blocks called _____.
 - 7 FCFS stands for _____
 - 8 A process in the _____ state is waiting for some event to occur.
 - 9 A deadlock occurs when processes wait for each other in a _____.
 - 10 Segmentation allows a program to be divided into _____ segments like code, data, and stack.
 - 11 In round-robin scheduling, each process is given a time quantum. (True/False)
 - 12 In dynamic partitioning, memory is allocated without internal fragmentation. (True/False)
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