

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY- GURAJADA VIZIANAGARAM
II B. Tech I Semester Supplementary Examinations, November – 2024
OPERATING SYSTEMS
(Common to CSE,IT,CST,CSE(CS),CS)

Time: 3 hours**Max. Marks: 70**

Answer any FIVE Questions
ONE Question from Each unit
All Questions Carry Equal Marks

- 1 a) Define an Operating System. Explain its primary functions in detail. [7]
 b) Discuss the various types of Operating Systems with examples. [7]
 (OR)
- 2 a) Explain the layered approach in operating systems with examples. How does it help in managing complexity? [7]
 b) Compare system calls in UNIX and Windows, highlighting their differences. [7]
- 3 a) Explain the concept of race conditions in inter-process communication and its impact. [7]
 b) Compare preemptive and non-preemptive scheduling algorithms, using an example with at least five processes. [7]
 (OR)
- 4 a) Explain multithreading and its advantages. How is multithreading managed in an operating system? [7]
 b) Consider the following four processes with their respective arrival times and CPU burst times: [7]

Process	Arrival Time (ms)	Burst Time (ms)
P1	0	7
P2	2	4
P3	4	1
P4	5	4

Calculate the Average Waiting Time and Average Turnaround Time for the given processes using FCFS Scheduling Algorithm.

- 5 a) Explain memory management techniques in operating systems. [7]
 b) Define and discuss paging. How does it help in memory management? [7]
 (OR)
- 6 a) Explain virtual memory. How is it implemented in an operating system? [7]
 b) Consider the following five processes with varying arrival times and burst times: [7]

Process	Arrival Time (ms)	Burst Time (ms)
P1	0	9
P2	1	5
P3	2	3
P4	3	6
P5	4	2

Calculate the Average Waiting Time and Average Turnaround Time for the given processes using Round Robin Scheduling Algorithm with a time quantum of 4 ms.

- 7 a) Define deadlock. Explain the necessary conditions for deadlock to occur. [7]
b) Describe various methods for handling deadlocks. [7]
(OR)
- 8 a) Explain the concept of disk scheduling. Discuss different disk scheduling algorithms. [7]
b) Explain the concept of RAID and its different levels. [7]
- 9 a) Discuss the principles and mechanisms for implementing security in operating systems [7]
b) Explain the goals of protection in operating systems and discuss the key protection mechanisms [7]
(OR)
- 10 a) Write the principles of protection? And explain the access matrix in detail. [7]
b) Discuss firewall mechanisms in operating systems for managing system and network security threats. [7]
