

School of Computing Science and Engineering
Bachelor of Technology in Computer Science and Engineering
Mid Term Examination - May 2024

Duration : 90 Minutes
Max Marks : 50

Sem IV - R1UC403B - Operating System

General Instructions
Answer to the specific question asked
Draw neat, labelled diagrams wherever necessary
Approved data hand books are allowed subject to verification by the Invigilator

- 1) What do you mean by system calls? K2 (2)
 - 2) Explain Inter Process Communication K1 (3)
 - 3) Differentiate between Distributed and Time-sharing operating systems K2 (4)
 - 4) Explain the Simple operating system structure. Describe the layered approach K2 (6)
 - 5) Explain different sub components of an operating system. K3 (6)
 - 6) Define essential properties of the following types of Operating system: K3 (9)
 i) Batch operating system ii) Interactive operating system iii) Time sharing operating system iv) Real time operating system v) Distributed operating system
 - 7) .Consider the following table which has 4 processes. All processes are arrived at time 0. CPU scheduling uses SJF algorithm and I/O scheduling uses SJF algorithm and I/O scheduling uses FCFS algorithm. Every process gets CPU service first and then it request I/O. CPU scheduling favours the less I/O service process whenever two or more processes have same CPU service time. What is the total time in which I/O device will not service any request from time 0 to the completion of last job? K4 (8)
- | Process | P1 | P2 | P3 | P4 |
|------------------|----|----|----|----|
| CPU Burst Time | 4 | 2 | 1 | 2 |
| I/O Service time | 3 | 2 | 3 | 1 |
- 8) What do you mean by binary semaphore and counting semaphore? K4 (12)
 With C struct, explain implementation of wait () and signal.

OR

Assume that all the processes are arrived at the same time. First process starts executed from “0” time unit. Every process completes its CPU request then gets I/O service. If any two processes are need same amount of of CPU service time then prefer the process which has less I/O service request. Find the time at which process P4 completes both CPU and I/O requests. Processes are scheduling using SJF for CPU services and I/O scheduling is done using FCFS scheduling. K4 (12)

Process	CPU Burst Time	I/O service Time
P1	4	3
P2	2	2
P3	1	3
P4	2	1