School of Computing Science and Engineering

B.Tech CSE
ETE - Jun 2023

Time : 3 Hours **Marks : 100**

Sem II - E1UJ202B /B080202T- Operating System

Your answer should be specific to the question asked
Draw neat labeled diagrams wherever necessary

1. What are the various objectives and functions of Operating System? K1 CO1 (5)

2. Explain safe and unsafe state in the context of deadlock. K2 CO2 (5)

3. Explain the concept of file and access methods. K3 CO3 (5)

4. Consider the following set of processes, with the length of the CPU-burst time given in milliseconds: K1 CO1 (10)

Process	Burst Time	Priority
P0	10	3
P1	1	1
P2	2	3
P3	1	4
P4	5	2

The processes are assumed to have arrived in the order P1, P2, P3, P4, P5, all at time 0.

a. Draw four Gantt charts illustrating the execution of these processes using FCFS, SJF, a nonpreemptive priority (a smaller priority number implies a higher priority), and RR (quantum = 1) scheduling.
b. What is the waiting time and turnaround time of each process for each of the scheduling algorithms in part (i)?

c. Which of the schedules in part (i) results in the minimal average waiting time (over all processes)?

5. What is a Process Control Block(PCB) and its role in context switching? Explain different types of schedulers used in process scheduling.Draw the block diagram of PCB. K2 CO2 (10)

6. Explain file system any two file allocation methods. K4 CO3 (10)

7. Describe the Banker's algorithm for safe allocation. Consider a system with three processes and three resource types at time to the following snapshot of the system has been taken: K4 CO4 (10)

	Allocation R1 R2 R3	Max R1 R2 R3	Available R1 R2 R3
P1	2 2 3	3 6 8	7 7 10
P2	2 0 3	4 3 3	
P3	1 2 4	3 4 4	

Answer the following questions using the banker's algorithm:
a. What is the content of the matrix Need?
b. Is the system in a safe state?
c. If a request from process P2 arrives for (1, 0, 0), can the request be granted Immediately?

OR

Explain following: K4 CO2 (10)
a) Swapping b) Paging c) Segmentation d) Thrashing e) Virtual Memory

8. What are operating system services?Compare between monolithic and Microkernel Systems With the help of an example. K3 CO1 (15)

9. Compare the preemptive and non preemptive scheduling algos with the help of suitable example. K3 CO2 (15)

10. Compare sequential file, indexed file and indexed sequential file. K4 CO3 (15)

OR

Define demand paging in memory management. What are the steps required to handle a page fault in demand paging? K4 CO4 (15)