

THE KAVERY ENGINEERING COLLEGE
(An Autonomous Institution)

B.E/B.TECH DEGREE END SEMESTER THEORY EXAMINATIONS, NOV /DEC 2024

Fourth Semester

Information Technology

CS3451 – Introduction to Operating Systems
(Common to Computer Science and Engineering)

Regulations - 2021

Duration : 3 Hrs

Maximum : 100 Marks

PART – A (ANSWER ALL QUESTIONS) (Marks 10*2=20)

Q. No.	Questions	BLT	CO	Marks
1.	Identify the use of an operating system.	RE	1	2
2.	What are the disadvantages of multiprocessor systems.	RE	1	2
3.	Outline the difference between the preemptive and non-preemptive scheduling.	UN	2	2
4.	"If there is a cycle in the resource allocation graph, it may or may not be indeed lock state". Comment on this statement.	AP	2	2
5.	How does the system discover thrashing?	AP	3	2
6.	List the steps required to handle a page fault in demand paging?	RE	3	2
7.	Give the disadvantages of contiguous allocation.	RE	4	2
8.	How does DMA increase system concurrency?	UN	4	2
9.	List the types of operating system.	RE	5	2
10.	What are the benefits of virtual machines?	RE	5	2

PART – B (ANSWER ALL QUESTIONS) (Marks 5*13 = 65)

Q. No.	Questions	BLT	CO	Marks
11.	a Explain different operating system structures with neat sketch.	UN	1	13
	Or			
	b i Evaluate the various types of system calls with an example for each.	UN	1	7
	ii Summarize about the functions of operating systems in detail.	UN	1	6
12.	a What is a semaphore and a counting semaphore? Explain how a semaphore can be used so that statement S ₁ of process P ₁ is always executed first and only then statement S ₂ of process P ₂ is executed.	UN	2	13
	Or			
	b Discuss about the deadlock detection with suitable example.	UN	2	13
13.	a Describe the LRU page replacement algorithm, assuming there are 3 frames and the page reference string is 7 0 1 2 0 3 0 4 2 3 0 3 2 1 2 0 1 7 0 1. Find the number of page faults.	AP	3	13
	Or			
	b When page faults will occur? Discuss the actions taken by operating system during page fault.	AP	3	13

14. a Describe in detail about file sharing and protection. UN 4 13
Or
- b i In a variable partition scheme, the operating system has to keep track of allocated and free space. Suggest a means of achieving this. Describe the effects of new allocations and process terminations in your suggested scheme. AP 4 5
- ii Explain the issues in designing a file system. UN 4 8
15. a Explain the types of virtual machines and their Implementations. UN 5 13
Or
- b Discuss about the different mobile operating systems. UN 5 13

*PART – C (Marks 1*15 = 15)*

<i>Q. No.</i>	<i>Questions</i>	<i>BLT</i>	<i>CO</i>	<i>Marks</i>
16. a	Consider the set of four processes whose arrival time and burst time are given below:	AN	2	15

Process No.	Arrival Time	Burst Time		
		CPU Burst	I/O Burst	CPU Burst
P1	0	3	2	2
P2	0	2	4	1
P3	2	1	3	2
P4	5	2	2	1

If the CPU scheduling policy is shortest remaining time first, calculate the average waiting time and average turnaround time.

Or

- b How could a system be designed to allow a choice of operating systems from which to boot? What would the bootstrap program need to do? AN 1 15