

THE KAVERY ENGINEERING COLLEGE*(An Autonomous Institution)*

UG/PG DEGREE END SEMESTER THEORY EXAMINATIONS, APRIL/MAY 2026

*Fourth Semester**Computer Science and Engineering*

UCST24402 / CS3451 - INTRODUCTION TO OPERATING SYSTEMS

(Common to Information Technology)

*Regulations - 2024 & 2021**Duration : 3 Hrs**Maximum : 100 Marks***PART - A (ANSWER ALL QUESTIONS) (Marks 10*2=20)**

<i>Q.No</i>	<i>Questions</i>	<i>BLT</i>	<i>CO</i>	<i>Marks</i>
1.	List out the types of operating systems.	L1	1	2
2.	What is a system call? Give an example.	L1	1	2
3.	Define semaphore. Specify its operations.	L1	2	2
4.	Consider the 3 process, P1, P2 and P3 as shown in the table.	L2	2	2

Process	Arrival time	Burst time
P1	0	5
P2	1	7
P3	3	4

Find the completion order of the 3 processes under the RR (round robin scheduling with CPU quantum of 2 time units).

5.	Differentiate Contiguous memory allocation and Noncontiguous memory allocation.	L2	3	2
6.	List out the benefits of virtual memory.	L2	3	2
7.	Name the various file operations.	L1	4	2
8.	How free space is managed using bit vector implementation?	L2	4	2
9.	How virtualized environments enable dynamic resource provisioning in cloud infrastructure.	L2	5	2
10.	Which layer of iOS contains fundamental system services for apps?	L1	5	2

PART - B (ANSWER ALL QUESTIONS) (Marks 5*16 = 80)

<i>Q.No</i>	<i>Questions</i>	<i>BLT</i>	<i>CO</i>	<i>Marks</i>
11.	a i Explain in detail about the various structures of operating systems.	L2	1	8
	ii Indicate the essential properties of distributed, Real time and Time Sharing operating systems with its advantages and disadvantages.	L2	1	8
	Or			
	b i Describe the various types of system calls in operating systems.	L2	1	8
	ii Describe about the various services offered by the operating system.	L2	1	8

12. a i Name and explain the different criteria that can be used to judge the performance of any CPU scheduling Algorithm. L2 2 8
- ii Explain how synchronization is implemented in Readers-Writers problem using semaphores. L2 2 8

Or

- b L3 2 16

Name	Allocation A B C	Max A B C	Available A B C
Mano	1 0 1	6 6 7	3 2 2
Myna	2 1 1	4 2 3	
Nithya	2 0 1	4 4 3	
Ganesh	2 1 1	3 2 2	
Gopal	3 3 2	5 4 5	

The above scenario shows the details of resources allocated to five persons at the beginning and also the maximum needs of resource types A, B and C in order to finish their job. Evaluate the following

- a) The Need of each person.
b) Is the above state a safe state?
c) If Gopal requests for (1, 0, 2), can this request be granted immediately?

13. a Consider the following page reference string 1, 2, 3, 4, 1, 2, 5, 1, 2, 3, 4, 5 for a memory with three frames. How many page faults would occur for following replacement algorithm? (i) LRU page replacement (ii) FIFO page replacement (iii) Optimal page replacement. L3 3 16

Or

- b Calculate the number of page faults using LRU, FIFO and OPT page replacement methods. The reference string is 5 6 4 2 4 1 6 4 6 8 9 2 1 4 6 9 and the number of frames is 3. L3 3 16

14. a Suppose that a disk drive has 5000 cylinders, numbered 0 through 4999. The drive is serving a request at cylinder 143. The queue of pending requests, in FIFO order is 86, 1470, 913, 1774, 948, 1509, 1022, 1750, 130. Starting from the head position what is the total distance (in cylinders) that the disk arm moves to satisfy all the pending requests for each of the following disk-scheduling algorithms? FCFS, SSTF, SCAN, LOOK, C-SCAN, C-LOOK. Explain the pros and cons of all disks scheduling algorithms. L3 4 16

Or

- b Explain different directory implementation methods. L2 4 16

15. a Explain in detail about the various types of virtual machines and their implementation. L2 5 16

Or

- b Describe the layered architecture of Mobile iOS and it's components with neat sketch. L2 5 16