Reg. No.												

Question Paper Code	12065

21 JUL 2023

B.E. / B.Tech - DEGREE EXAMINATIONS, APRIL / MAY 2023

Fourth Semester

Computer Science and Engineering

(Common to Information Technology, M.Tech. - Computer Science and Engineering & Third Semester - Artificial Intelligence and Data Science)

20CSPC401 – OPERATING SYSTEMS

(Regulations 2020)

Duration: 3 Hours | Max. Marks: 100

PART - A (10 × 2 = 20 Marks)

Answer ALL Questions

		Marks, K-Level,CO
1.	Define Kernel.	*2,K1,CO1*
2.	Define Cache memory.	*2,K1,CO1*
3.	What is meant by context switching?	*2,K1,CO2*
4.	List the necessary conditions for deadlock.	*2,K2,CO3*
5.	Differentiate internal and external fragmentation.	*2,K2,CO3*
6.	What are overlays? Compare swapping and overlays.	*2,K2,CO4*
7.	Define seek time and latency time.	*2,K1,CO4*
8.	What are the advantages of Linked allocation?	*2,K1,CO5*
9.	What is the responsibility of kernel in Linux operating system?	*2,K2,CO5*
10.	Which layer of iOS contains fundamental system services for apps?	*2,K2,CO6*

PART - B (5 × 13 = 65 Marks)

Answer ALL Questions

11.	a)	Explain Operating System Structure and components.	*13,K2,CO1*
		OR	
	b)	Sketch the structure of Direct Memory Access and explain in detail.	*13,K2,CO1*
12.	a)	Explain the FCFS and Round Robin (time slice = 2) scheduling algorithms with Gantt charts for the four Processes given. Compare their average turnaround and waiting time.	*13,K3,CO2*

Process	Arrival Time	Waiting Time
P1	0	8
P2	1	4
P3	2	9
P4	3	5

OR

K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze; K5 – Evaluate; K6 – Create

b) Explain Deadlock detection (Banker's Algorithm) with example. *13,K2,CO3*

13. a) Explain FIFO, optimal and LRU page replacement algorithms with an example reference Strings. Mention the merits and demerits of each of the above algorithms. *13,K2,CO4*

OR

b) Explain about File System Mounting in detail. *13,K2,CO4*

14. a) Explain the different disk scheduling algorithms with examples. *13,K2,CO4*

OR

b) Write short notes on file protection and sharing. *13,K2,CO5*

15. a) Explain the Linked list and indexed file allocation methods with neat diagram. *13,K2,CO5*

OR

b) Write about any one Mobile OS in detail. *13,K2,CO*

PART - C (1 × 15 = 15 Marks)

16. a) Consider the following snapshot of a system

	Allocation	***Max***	***Available***
	A B C	*A B C*	*A B C*
P_0	0 1 0	7 5 3	3 3 2
P_1	2 0 0	3 2 2	
P_2	3 0 2	9 0 2	
P_3	2 1 1	2 2 2	
P_4	0 0 2	4 3 3	

(i) What is the content of matrix Need? *3,K3,CO4*

(ii) Is the system in a safe state? *6,K3,CO4*

(iii) If a request from process P1 arrives for (1,2,1) can the request be granted immediately? *6,K3,CO4*

OR

b) Given memory partitions of 100KB, 500KB, 200KB, 300KB and 600KB(in order), how would each of the first-fit, best-fit and worst-fit algorithms place processes of212KB, 417KB, 12KB and 426KB(in order)? Which algorithm makes the most efficient use of memory? *15,K3,CO4*