

Reg. No.

Question Paper Code

11064


SAI RAM INSTITUTE OF TECHNOLOGY

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B.E / B.Tech. DEGREE EXAMINATIONS, APRIL/MAY 2021

Fourth Semester

Computer Science and Engineering

(Common to Information Technology)

CS8493 - Operating Systems

(Regulations 2017)

Duration: 3 Hours

Max. Marks 100

Answer ALL Questions

PART-A (10 × 2 = 20 Marks)

1.	Define operating systems. List out the functions of the OS.	K1	CO1
2.	What are the differences between user-level threads and kernel-level threads?	K4	CO1
3.	What is the difference between pre-emptive and non-preemptive scheduling?	K4	CO3
4.	State 4 conditions for a deadlock situation to arise.	K2	CO2
5.	Why are page sizes always powers of 2?	K4	CO4
6.	Differentiate internal and external fragmentation.	K4	CO4
7.	Mention any four file attributes.	K2	CO5
8.	Why rotational latency is usually not considered in disk scheduling?	K2	CO5
9.	What do you mean by Journaling in linux?	K2	CO6
10.	Mention any two features of Linux file system.	K2	CO6

PART – B (5 × 13 = 65 marks)

11.	a)	Explain the various types of system calls with examples for each.	13	K2	CO1
		OR			
	b)	i. Explain the various structure of an operating system.	8	K2	CO1
		ii. Discuss about multiprocessor and multicore organization.	5	K2	CO1
12.	a)	Define process and discuss various process states with state transition diagram.	6	K2	CO2
		Explain multilevel queue and multilevel feedback queue scheduling with suitable example.	7	K2	CO3
		OR			
	b)	(i) Discuss in detail critical section problems and also write the algorithm for Readers-Writers problem with semaphores.	7	K2	CO2
		(ii) Compare and contrast the process scheduling algorithms	6	K2	CO3
13.	a)	Explain paging and the process of address translation. List out the pros and cons of paging.	13	K2	CO4
		OR			
	b)	(i) Consider the following page reference string: 1, 2, 3, 4, 2, 1, 5, 6, 2, 1, 2, 3, 7, 6, 3, 2, 1, 2, 3, 6. How many page faults would occur for the following replacement algorithms, assuming three and four frames? Remember all frames are initially empty, so your first unique pages will all cost one fault each.	8	K5	CO4
		• LRU replacement			
		• FIFO replacement			
		• Optimal replacement			
		(ii) Define thrashing. Explain the cause for thrashing?	5	K2	CO4
14.	a)	(i) Compare the various disk scheduling algorithms.	6	K4	CO5
		(ii) Discuss in detail about swap space management.	7	K2	CO5
		OR			
	b)	(i) Explain various file allocation methods with pros and cons of each with neat diagram.	6	K2	CO5
		(ii) Describe about free space management.	7	K2	CO5
15.	a)	Explain in detail about Linux system design principles.	13	K2	CO6
		OR			
	b)	Sketch and describe the SDK framework in iOS and explain its architecture	13	K2	CO6

PART C (1 × 15 = 15)

16. a) Explain the FCFS, SJF non preemptive and preemptive SJF, priority scheduling, Round Robin scheduling algorithms with Gantt charts. Compare the average turnaround time and waiting time. 15 K5 CO3

Process	Burst time	Arrival Time
P1	8	0.0
P2	4	0.4
P3	1	1.0

Which of the following scheduling algorithm could result in Starvation?

OR

- b) Consider the following Snapshot of a system. 15 K5 CO2
 Answer the following
 (i) What is the content of need matrix?
 (ii) Is the system in a safe state?
 (iii) If the request for the process P4 arrives for (1,2,0,0) can it be granted immediately?

	Maximum				Allocation				Available			
	a	b	c	d	a	b	c	d	a	b	c	d
P0	6	0	1	2	4	0	0	1	3	2	1	1
P1	1	7	5	0	1	1	0	0				
P2	2	3	5	6	1	2	5	4				
P3	1	6	5	3	0	6	3	3				
P4	1	6	5	6	0	2	1	2				