Maximum Marks: 100	Semester: MAY-2024 Examination: ESE Examination – KT

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	Examination: ESE Examination – KT		
Programme code: 01			
Programme: B.Tech in Computer Engg.	Class: TY	Semester:_V_(SVU 2020)	
Name of the Constituent College: K. J. Somaiya College of Engineering	Name of the department: Computer Engineering		
Course Code: 116U01C503	Name of the Course: Operating System		
Instructions: 1)Draw neat diagrams 2) All questions are compulsory 3) Assume suitable data wherever necessary			

Que. No.	Question	Max. Marks
Q1	Solve any **Four**	20
i)	What is the critical section? What are the minimum requirements that should be satisfied by a solution to critical section problem?	5
ii)	Explain Free Space Management.	
iii)	Give Peterson solution to the Critical section Problem. Give its limitation.	5
iv)	Differentiate between time sharing and real time operating system.	5
v)	Define process. Give the structure of process in Memory.	5
vi)	What is Medium Term scheduler. Explain its role in the Computer system.	5
		5

Que. No.	Question	Max. Marks
Q2 A	Solve the following	10
i)	Explain different Multithreading Models.	5
ii)	What are the various file accessing methods? Explain them.	5
	OR	
Q2 A	Explain the problem of Busy Waiting. Give the solution to this problem in Semaphore.	10
Q 2 B	Solve any **One**	10
i)	Explain the different schemes for defining the logical structure of a directory?	10
ii)	Explain about Linux's Completely-Fair scheduler in detail.	10

Que. No.	Question	Max. Marks
Q3	Solve any **Two**	20
i)	Assume the following workload in a system:	10

Process	Arrival Time	Burst Time
P1	5	5
P2	4	6
P3	3	7
P4	1	9
P5	2	2
P6	6	3

		Draw a Gantt chart illustrating the execution of these jobs using Round robin scheduling algorithm and also Calculate the average waiting time and average turnaround time.	
	ii)	List various structures of Page Table and Explain them in detail with supporting diagrams.	10

	iii)	With respect to multiple Processor Scheduling, Explain:
		   a. Symmetric and Asymmetric processing
		   b. Process affinity
		   c. Load balancing
			10

Que. No.	Question	Max. Marks
Q4	Solve any **Two**	20
i)	A disk drive has 200 cylinders, numbered 0 to 199. The drive is currently serving a request at cylinder 53. The queue of pending requests, in order is 98, 183, 37, 122, 14, 124, 65, 67. Starting from the current 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? i) FCFS ii) SSTF iii) SCAN iv) LOOK v) C-SCAN	10

ii)	Consider the following snapshot of a system:
	
	      Allocation *Max* *Available*
	      A B C D A B C D A B C D
	 P_0 0 0 1 2 0 0 1 2 1 5 2 0
	 P_1 1 0 0 0 1 7 5 0
	 P_2 1 3 5 4 2 3 5 6
	 P_3 0 6 3 2 0 6 5 2
	 P_4 0 0 1 4 0 6 5 6
	
	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 P1 arrives for (0,4,2,0), can the request be granted immediately?
		10

iii)	Define the hardware instruction Test And Set() and Swap() also give the mutual exclusion implementation with both.	10

Que. No.	Question	Max. Marks
Q5	(Write notes / Short question type) on any **four**	20
i)	Discuss Resource allocation graph with respect to deadlock.	5
ii)	"Operating system is resource manager"-Justify this statement with suitable functionality of OS.	5
iii)	Give the differences between logical and physical addresses.	5
iv)	Explain system Boot Process.	5
v)	Differentiate between multilevel queues and multilevel feedback queues.	5
vi)	What is a System call? Explain in detail the system call sequence to copy the contents of one file to another file.	5