R22 Regulation *Subject code:4E5EB*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

(Autonomous, Accredited by NAAC with 'A+' Grade)

B.Tech V Semester Regular Examinations, December 2024

OPERATING SYSTEMS

(CSE)

Maximum Marks: 60 Date:28.12.2024 Duration: 3 hours

Note: **1.This question paper contains two parts A and B.**
2. Part A is compulsory which carries 10 marks. Answer all questions in Part A.
3. Part B consists of 5 Units. Answer any one full question from each unit.
4. Each question carries 10 marks and may have a, b, c, d as sub questions.

	Part-A	CO	Bloom Tx
All the following questions carry equal marks (10X1M=10 Marks)			
1.a)	Outline the objectives of an Operating System.	1	L2
b)	How parameters can be passed to system calls?	1	L1
c)	Define Thread.	2	L1
d)	Distinguish between I/O bound process and CPU bound process.	2	L2
e)	What do you mean by Mutual exclusion?	3	L1
f)	Write two possible solutions of readers-writers problem.	3	L1
g)	State the purpose of TLB.	4	L1
h)	What is the purpose of paging the page tables?	4	L1
i)	List the various attributes that are associated with an opened file.	5	L1
j)	Define the Principles of protection.	5	L1

	Part-B	CO	Bloom Tx
Answer All the following questions. (5X10M=50Marks)			
2	What is a System call? Explain the various types of system calls provided by an operating system. [10M]	1	L3
	OR		
3	Illustrate the dual mode operation in OS with a neat block diagram. [10M]	1	L3
4	Consider the set of 5 processes whose arrival time and burst time are given below [10M]	2	L3

Process Id	Arrival Time	Burst Time
P1	3	1
P2	1	4
P3	4	2
P4	0	6
P5	2	3

Calculate the average waiting time and average turnaround time using i)Shortest Job First ii)Shortest Remaining Time First iii)Round Robin

OR

5.a)	Compare and contrast user level threads and kernel level threads. [5M]	2	L3
b)	With neat sketch discuss the process state diagram in detail. [5M]		L3
6.a)	Illustrate producer consumer problem with code. [5M]	3	L3
b)	Define critical section problem? Discuss any two classic problems of synchronization [5M]		L3
	OR		
7.	Consider the following snapshot of a system [10M] *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 Evaluate the following questions using the banker's algorithm: Is the system in a safe state? If a request from process P1 arrives for (1,0,2). Can the request be granted immediately?	3	L5
8	Describe contiguous memory allocation. Consider a swapping system in which memory consists of the following hole sizes in memory order: 12 KB, 4 KB, 24 KB, 15 KB, 9 KB, 7 KB, 10 KB, and 11 KB. Analyze which hole is taken for successive segment requests of 14 KB, 8 KB, 5 KB for first fit, best fit, worst fit, and next fit approaches. [10M]	4	L4
	OR		
9	Define Virtual Memory. Explain the process of converting virtual addresses to physical addresses with a neat diagram. [10M]	4	L3
10	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 FIFO order, is 98, 183, 37, 122, 14, 124, 65, and 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 [10M]	5	L5
	OR		
11.a)	Interpret different file access methods. [5M]	5	L3
b)	Define access matrix? Explain the implementation of access matrix in detail. [5M]		L3