



R22 Regulation

Subject code:4E5EB

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech V Semester Supplementary Examinations, May 2025

OPERATING SYSTEMS

(CSE)

Maximum Marks: 60

Date: 19.06.2025

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

All the following questions carry equal marks (10X1M=10 Marks)		Marks	CO	Bloom Tx
1.a)	List any two different views of Operating System.	1M	1	L4
b)	What is the main advantage of the layered approach to system design?	1M	1	L1
c)	Define thread.	1M	2	L1
d)	What do you mean by multilevel queue scheduling?	1M	2	L1
e)	What is a critical section?	1M	3	L1
f)	Define semaphores.	1M	3	L1
g)	Compare logical address and physical address.	1M	4	L2
h)	What do you mean by page fault?	1M	4	L1
i)	Define the term seek time.	1M	5	L1
j)	What are the operations of directory?	1M	5	L1

Part-B

Answer All the following questions. (5X10M=50Marks)		Marks	CO	BloomTx																		
2	Define System call. Explain various types of System calls with an examples.	10M	1	L3																		
OR																						
3	Illustrate the essential properties of Time sharing and Distributed systems.	10M	1	L3																		
4	Consider a System with 5 processes with their arrival time and burst time as shown in following table. Calculate the average waiting time and average turnaround time using FCFS and Round Robin with time quantum 2.	10M	2	L4																		
<table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Process Id</th> <th>Arrival Time</th> <th>Burst Time</th> </tr> </thead> <tbody> <tr> <td>P1</td> <td>0</td> <td>5</td> </tr> <tr> <td>P2</td> <td>1</td> <td>3</td> </tr> <tr> <td>P3</td> <td>2</td> <td>1</td> </tr> <tr> <td>P4</td> <td>3</td> <td>2</td> </tr> <tr> <td>P5</td> <td>4</td> <td>3</td> </tr> </tbody> </table>					Process Id	Arrival Time	Burst Time	P1	0	5	P2	1	3	P3	2	1	P4	3	2	P5	4	3
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OR																																
5	a) With a neat sketch explain process state diagram.	5M 5M	2	L1																												
	b) What is a process? Examine Process Control Block.			L3																												
6	a) What is a Monitor? Explain how Dining Philosophers problem solved	5M 5M	3	L2																												
	b) Explain the reader's-writer's problem and its solution using the concept of semaphores with pseudo code			L4																												
OR																																
7	<p>Consider the following snapshot of a system</p> <table style="margin-left: 40px;"> <thead> <tr> <th></th> <th><u>Allocation</u></th> <th><u>Max</u></th> <th><u>Available</u></th> </tr> <tr> <th></th> <th>A B C</th> <th>A B C</th> <th>A B C</th> </tr> </thead> <tbody> <tr> <td>P_0</td> <td>0 1 0</td> <td>7 5 3</td> <td>3 3 2</td> </tr> <tr> <td>P_1</td> <td>2 0 0</td> <td>3 2 2</td> <td></td> </tr> <tr> <td>P_2</td> <td>3 0 2</td> <td>9 0 2</td> <td></td> </tr> <tr> <td>P_3</td> <td>2 1 1</td> <td>2 2 2</td> <td></td> </tr> <tr> <td>P_4</td> <td>0 0 2</td> <td>4 3 3</td> <td></td> </tr> </tbody> </table> <p>Answer 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, and 2). Can the request be granted immediately?</p>		<u>Allocation</u>	<u>Max</u>	<u>Available</u>		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		10M	3	L5
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8	Consider the following reference string 7, 0, 1, 2, 0, 3, 0, 4, 2, 3, 0, 3, 2, 1, 2, 0, 1, 7, 0, 1. Find the number of page faults with FIFO, Optimal Page replacement and LRU with three frames which are empty initially. Which algorithm gives the minimum number of page faults?	10M	4	L3																												
OR																																
9	Given free memory partitions of 100 K, 500 K, 200 K, 300 K, and 600 K (in order), how would each of the First-fit, Best-fit, and Worst-fit algorithms place processes of 212 K, 417 K, 112 K, and 426 K (in order)?	10M	4	L4																												
10	What are the objectives of file management system? Explain file system architecture.	10M	5	L1																												
OR																																
11	What is file and explain types of file operations with system calls.	10M	5	L3																												