R22 Regulation *Subject code: 4E4FC*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech IV Semester Supplementary Examinations, December 2024

OPERATING SYSTEMS

(IT)

Maximum Marks: 60 Date:10.12.2024 Duration: 3 hours

Note: **1. This question paper contains two parts A and B.**
2. Part A is compulsory and 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)			L1
1.a)	What are the operations provided by Operating systems?	CO1	L1
b)	List the services provided by Operating systems.	CO1	L1
c)	Identify the situations for preemption of a process.	CO2	L1
d)	Differentiate between Preemptive and Non-preemptive scheduling	CO2	L1
e)	What is the purpose of Paging and Page tables?	CO3	L1
f)	Define swapping.	CO3	L1
g)	What are the various file-accessing methods?	CO4	L1
h)	Outline directory structure in file management system.	CO4	L1
i)	What is a Semaphore? Mention its properties.	CO5	L1
j)	What are the necessary conditions for the occurrence of deadlock?	CO5	L1
	Part-B		
Answer All the following questions. (5X10M=50Marks)			Bloom Tx level
2	a) "Operating system is resource manager"-Justify this statement with suitable functionality of OS. [5M] b) List and explain the operating system services concerning users and efficient operations of the system. [5M]	CO1	L5 L2
	OR		
3	a) What is a system call? Explain how the system call works. [5M] b) Explain the design issues of operating systems. [5M]	CO1	L2 L2
4	a) Elaborate the steps involved in process creation and process termination. [5M] b) What is thread? and explain various types of threads in detail. [5M]	CO2	L6 L2
	OR		
5	Describe the characteristics of SJF scheduling algorithm. Consider there are five jobs named as P1, P2, P3, P4 and P5. Their arrival time and burst times are given below. [10M]	CO2	L6

	Process Id | **Arrival time** | **Burst time** P1 | 1 | 7 P2 | 3 | 3 P3 | 6 | 2 P4 | 7 | 10 P5 | 9 | 8 Draw a Gantt chart illustrating the execution of these jobs using the SJF algorithm and also Calculate the average waiting time and average turnaround time.		
6	a) Explain contiguous memory allocation in detail with an example. [5M] b) What is segmentation and explain how memory allocating in segment table. [5M]	CO3	L2 L2
	OR		
7	Consider the reference string: [10M] 7, 0, 1, 2, 0, 3, 0, 4, 2, 3, 0, 3, 2, 1, 2, 0, 1, 7, 0, 1 For a memory with three frames. Trace FIFO, optimal, and LRU page replacement algorithms.	CO3	L3
8	Summarize a short note on the following system calls: [10M] i) Open ii) write iii) seek iv) stat	CO4	L2
	OR		
9	Write about the on-disk and in-memory structures used to implement a file system. [10M]	CO4	L2
10	a) Explain the techniques used to prevent the deadlocks. [5M] b) Explain Banker's deadlock-avoidance algorithm with an illustration. [5M]	CO5	L2
	OR		
11	a) What are the principles of protection and Domains of protection? [5M] b) Explain implementation of access matrix. [5M]	CO5	L2 L2