R20 Regulation *Subject code:3P3EF*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech III Semester Regular/Supplementary Examinations, March/April 2023

OPERATING SYSTEMS

(Common to CSE, CSE(AI&ML) and CSE(DS))

Maximum Marks: 70 Date:12.04.2023 Duration: 3 hours

Note: 1.This question paper contains two parts A and B.
2. Part A is compulsory which carries 20 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 (10x2M=20 Marks)

1 Write how a user application invoking the open () system call is handled?
2 What are the functions of memory management?
3 What is the difference between a process and a thread?
4 Write about Context Switching
5 What are the necessary and sufficient conditions to occur deadlock?
6 What is a Page fault?
7 What is meant by thrashing?
8 What is pre-allocation and dynamic allocation.
9 Define the terms seek time and rotational latency
10 What are the various methods for protection and access control?

Part-B

Answer All the following questions. (5X10M=50Marks)

11 (a)List out the types of operating system and explain batch OS and time-sharing OS in brief. 5M
(b)What are the services provided by operating system? Explain. 5M

OR

12 Explain different categories of system calls with suitable example. 10M

13 Consider the following set of processes, with the length of the CPU burst given in milliseconds: 10M

Process	Burst Time	Priority
P1	27	5
P2	12	1
P3	37	2
P4	19	4
P5	10	3

The processes are assumed to have arrived in the order P1, P2, P3, P4, P5 all at time 0. Draw the Gantt charts that illustrate the execution of these processes using the following scheduling algorithms: FCFS, SJF and Priority. Also determine the average waiting time and average turnaround time for each of the algorithms.

OR

14 (a) What are the criteria for evaluating the CPU scheduling algorithm? 5M
(b) Explain FIFO and Round Robin CPU scheduling algorithm. Why do we need? 5M

15 A process refers to 5 pages A, B, C, D and E in order- A;B;C;D;A;B;E;A;B;C;D;E. If the page replacement algorithm is LRU calculate the number of page faults with empty frames of size 4 10M

OR

16 (a) Explain the Resource-Allocation-Graph algorithm for deadlock avoidance. 5M
(b)State the Critical Section problem. Illustrate the software-based solution to the Critical Section problem. 5M

17 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 optimal page replacement algorithm, assuming three frames and all frames are initially empty. 10M

OR

18 (a)What is a Directory? Write short note on Directory implementation. 5M
(b) Discuss various issues related to the allocation of frames to processes. 5M

19 (a) Compare and contrast free space management and swap space management 5M
(b) Explain the file system architecture. 5M

OR

20 (a)Discuss the different file allocation methods with suitable example. 6M
(b) Explain Revocation of Access Rights in detail, 4M