R18 Regulation *Subject code: 2P5FA*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech V Semester Supplementary Examinations, June 2022

OPERATING SYSTEMS

(Information Technology)

Maximum Marks: 70 Date:02.07.2022 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 What is an Operating system? What are the various OS Components?
2 Define system call.
3 Compare and Contrast preemptive Scheduling and non-preemptive scheduling?
4 What is Critical section problem?
5 Write the difference between internal and external fragmentation
6 What is Virtual Memory? Why is it required
7 Define Thrashing
8 What are the files attributes updated during file creation?
9 Write down the principles of protection
10 What are the typical operations that can be performed on directory

Part-B

Answer All the following questions. **(10M X 5=50Marks)**

11 a) Explain the objectives and functions of Operating system
b) Explain in detail about the functions of System Call Interface 5+5

OR

12 What is the need for system calls? Explain the types of system calls provided by an operating system with respect to memory management

13 a) Following is the snapshot of a CPU 10

Process	CPU Burst	Arrival Time
P1	75	0
P2	40	10
P3	25	10
P4	20	80
P5	45	85

Draw the Gantt chart and calculate the turnaround time and waiting time of the jobs for FCFS (First Come First Served), SJF (Shortest Job First), SRTF (Shortest Remaining Time First) and RR (Round Robin with time quantum 15) scheduling algorithms.
b) Explain the concept of semaphores with an example 6+4

OR

14 a) Explain process states

b) Discuss readers/writers problem and give solution by using semaphores where readers have priority

15 a) Consider the following page reference string: 5+5
1,2,4,7,3,5,6,3,6,1,4,2,3,6,5,2
How many page faults would occur for the LRU page replacement algorithm, assuming four frames and all frames are initially empty
b) What is a monitor? Explain how dinning philosopher's problem is solved using monitors with example pseudo code 5+5

OR

16 a) Discuss various techniques to recover from the deadlock
b) Consider the following page reference strings:
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 following replacement algorithm, assuming three, four frames? Remember that all frames are initially empty, so your first unique pages will cost one fault each.
i) LRU replacement
ii) Optimal replacement.

17 a) Explain different File Attributes and File Operations 5+5
b) How demand paging affects the performance of a computer system? Give explanation. 5+5

OR

18 a) How does the system detect Thrashing? What can the system do to eliminate this problem? Explain
b) In detail explain the structure of disk with a neat diagram. How to attach to the existing memory resource? 5+5

19 a) What is a Directory? Write short note on Directory implementation
b) Explain about linked allocation method of a file 5+5

OR

20 a) Give the File System architecture. How file management and OS concerns differ
b) List out goals and principles of protection 5+5