R20 Regulation *Subject code: 3P3EF*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech III Semester Supplementary Examinations, July 2022

OPERATING SYSTEMS

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

Maximum Marks: 70 01.08.2022 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 kernel and list its functions
2 List out any four process control system calls?
3 Write various scheduling criteria for CPU scheduling?
4 Draw process state diagram
5 What is the use of Valid-Invalid Bits in Paging?
6 Define Swapping
7 What is file sharing?
8 What is TLB
9 List the goals of protection?
10 Write the main differences between capability lists and access lists?

Part-B

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

11 A. Explain about multiprogramming and time-sharing operating system? [5M]
B. What are the various objectives and functions of Operating systems? [5M]

OR

12 Define an operating system? State and explain the basic functions and services of an operating system? [10M]

13 Consider the following set of processes with the length of the CPU burst time given in milliseconds

Process	BurstTime	Priority
P1	10	3
P2	1	1
P3	2	3
P4	1	4
P5	5	2

The processes are assumed to have arrived in the order p1, p2, p3, p4, p5 all at time 0. [10M]

a) Draw four Gantt charts illustrating the execution of these processes using FCFS, SJF, non pre-emptive priority (a smaller priority number implies a higher priority) and RR (quantum=1) scheduling.

b) What is the turnaround time of each process for each of the scheduling algorithms in part?

c) What is the waiting time of each process for each of the scheduling algorithms in part? Which of the schedules in part a result in the minimal average waiting time?

OR

14 What is the important feature of critical section? State the Readers Writers problem and give solution using semaphore. [10M]

15 Consider the following snapshot of a system [10M]

PROCESS	ALLOCATION			*MAX*			AVAILABLE		
	A	B	C	*A*	*B*	*C*	A	B	C
P1	0	1	0	*7*	*5*	*3*	3	3	2
P2	2	0	0	*3*	*2*	*2*			
P3	3	0	2	*9*	*0*	*2*			
P4	2	1	1	*2*	*2*	*2*			
P5	0	0	2	*4*	*3*	*3*			

And answer the following Questions

a) compute the need matrix

b) is the system in a safe state?

c) if a request from process P1 arrives for (1,0,2), can the request be granted immediately?

OR

16 a) Illustrate the use of Banker's Algorithm for Deadlock Avoidance [5M]

b) Discuss paging and structure of page table in detail [5M]

17 A. Explain about the following page replacement algorithms with an example [5M]
a)FIFO b)Optimal, c)LRU

B. What is virtual memory? Mention its advantages. [5M]

OR

18 Consider the following page reference string. [10M]
7,0,2,0,3,0,4,2,3,0,3,2,1,2,0,1,7,0
Assuming three frames, how many page faults would occur in each of the following cases?

i. FIFO
ii. Optimal
iii. LRU

19 a) Write a short note on protection & security [5M]

b) What is the linked list allocation file implementation technique? [5M]

OR

20 a) Explain the access methods of files. [5M]

b) Briefly outline the directory overview. [5M]