PONDICHERRY UNIVERSITY
SCHOOL OF ENGINEERING AND TECHNOLOGY
DEPARTMENT OF COMPUTER SCIENCE, KARAIKAL CAMPUS
EVEN SEMESTER EXAMINATIONS, JUNE 2021
SEMESTER : _____
Operating Systems

Maximum Time: 1 Hour 30 Minutes Maximum Marks: 60

Answer the **Six** Questions **(6X 10 = 60 Marks)**

1. Solve the following problem using Banker's Algorithm:
Assume that there are 5 processes, P0 through P4, and 4 types of resources. At T0 we have the following system state:

Max Instances of Resource Type A = x (x allocated + x Available)
Max Instances of Resource Type B = x (x allocated + x Available)
Max Instances of Resource Type C = x (x allocated + x Available)
Max Instances of Resource Type D = x (x allocated + x Available)

Create the need matrix, Use the safety algorithm to test if the system is in a safe state or not?

2. Solve the following CPU Scheduling Problems:

Process	Burst	Priority
P1	x	x
P2	x	x
P3	x	x
P4	x	x
P5	x	x

a. Draw a diagram to show the CPU allocation for the above data using First-Come, First-Served (FCFS) Scheduling and calculate the average waiting time.

b. Draw a diagram to show the CPU allocation for the above data using Shortest-Job-First (SJF) Scheduling and calculate the average waiting time.

3. Solve the following CPU Scheduling Problems:

Process	Burst	Priority
P1	x	x
P2	x	x
P3	x	x

P4	x	x
P5	x	x

a. Draw a diagram to show the CPU allocation for the above data using Preemptive Shortest-Remaining-Time-First (SRTF) Scheduling and calculate the average waiting time.

b. Draw a diagram to show the CPU allocation for the above data using Round Robin (1ms Quantum) Scheduling and calculate the average waiting time.

4. Solve the following Disc Scheduling Problems:

Queue : x, x, x, x, x, x, x, x
Head Starts at: x

a. Draw a diagram to show the Head movements for the above data using First Come First Serve (FCFS) Disc Scheduling and calculate the Total head movement.

b. Draw a diagram to show the Head movements for the above data using Shortest Seek Time First (SSTF) Disc Scheduling and calculate the Total head movement.

5. Solve the following Page Replacement problem using First-In-First-Out (FIFO) Algorithm:

Reference string: **x,x,x,x,x,x ……..,**
3 frames (3 pages can be in memory at a time per process)

Show the page replacements for the above reference string and Calculate the total page faults.

6. Solve the following Page Replacement problem using Least Recently Used (LRU) Algorithm:

Reference string: **x,x,x,x,x,x ……..,**
3 frames (3 pages can be in memory at a time per process)

Show the page replacements for the above reference string and Calculate the total page faults.

Note: All 'x' marks will be replaced by numerals. Practice sample problems using reading materials.