

15/3/24 ATKT

Class : SYCS

ATKT (08)

Seat Number:- \_\_\_\_\_

Course : Principles of Operating System

Duration: 2½ hours

Marks: 75

Note: 1) All questions are Compulsory.  
2) Figures to the right indicate maximum marks.

1. Attempt **any four** of the following : (20)
- a) Describe the Functions of Operating System CO1 - (R)
  - b) Explain Computing Environments CO1 - (U)
  - c) What is System calls and explain its types CO1 - (U)
  - d) Define Simple Structure , Layered Structure , MicroKernel, Modules CO1 - (U)
  - e) Explain Schedulers and its types CO1 - (R)
  - f) What is Process Creation and Process Termination CO1 - (R)

2. Attempt **any four** of the following : (20)
- a) What is Race Condition CO2 - (R)
  - b) Explain Reader Writer Problem CO2 - (U)
  - c) Describe Peterson's Solution CO2 - (R)
  - d) Explain the Types of Scheduling CO2 - (R)
  - e) Consider the following set of processes with length of CPU Arrival time and burst time given in milliseconds. Illustrate the execution of these processes using the FCFS scheduling algorithm. Calculate Wait time, Average wait time, and Turn around time, Average turn around time of each process. Also draw the Gantt Chart

Process	Arrival Time	Burst Time
P1	1	2
P2	2	4
P3	0	6
P4	3	3

CO2 - (U)

- f) Consider the following set of processes with length of CPU Arrival time and burst time given in milliseconds. Illustrate the execution of these processes using Non Preemptive Priority Scheduling Algorithm. Calculate Wait time, Average wait time, and Turn around time, Average turn around time of each process. Also draw the Gantt Chart

Process	Arrival Time	Burst Time	Priority
P1	1	2	3(Highest)
P2	2	4	2
P3	0	6	1

CO2 - (U)

3. Attempt **any four** of the following :

(20)

- What is Logical Address
- Explain Contiguous Memory Allocation
- Describe Magnetic Disk and Magnetic Tapes
- Explain File Operations
- What is Single level Directory and Two level Directory
- Explain Multiple-Level Queues Scheduling

CO3 - (R)

CO3 - (R)

CO3 - (R)

CO3 - (U)

CO3 - (U)

CO3 - (R)

4. Attempt **any five** of the following :

(15)

- Define Independent Process, Cooperating Process : Shared Memory Model
- Explain Various types of Multithreading models
- What is Critical Section
- Consider the following set of processes with length of CPU Arrival time and burst time given in milliseconds. Illustrate the execution of these processes using the SRTF scheduling algorithm. Draw the Gantt Chart

CO4 - (U)

CO4 - (R)

CO4 - (R)

Process	Burst Time	Arrival Time
P1	6ms	2ms
P2	2ms	5ms
P3	8ms	1ms
P4	3ms	0ms
P5	4ms	4ms

CO4 - (U)

- e) Consider the following set of processes with length of CPU Arrival time and burst time given in milliseconds. Illustrate the execution of these processes using Round Robin (RR) Scheduling Algorithm. Calculate wait time and finish time of each process. Draw the Gantt Chart. Time Quantum=4

Process	Arrival Time	Burst Time
P1	0	24
P2	0	3
P3	0	3

CO4 - (U)

CO4 - (R)

- f) Define Swapping