

DURATION: - 2½ hrs

831151024

SEAT NO: _____

MARKS:- 75

Note: - (1) All questions are compulsory.

(2) Figures to the right indicate full marks

(3) Answer to each question must be on a new page

Q.1) Attempt the following (Any 4) 20M

- 1) Explain the roles of operating system CO1-U
- 2) Discuss the process state CO1-A
- 3) Explain user level thread and kernel level thread and describe mapping CO1-U
- 4) What is the purpose of system call? Explain with examples CO1-U
- 5) Describe OS structure CO1-R
- 6) Define short-term, mid-term and long-term scheduler CO1-U

Q.2) Attempt the following (Any 4) 20M

- 1) Explain producer consumer problem CO2-U
- 2) Given the following process with their arrival time and burst times, Demonstrate the execution using the non-pre-emptive SJF scheduling algorithm. Calculate the ST, WT, FT, TAT, average wait time average turnaround time. Draw the Gantt chart CO2-A

| Process | Arrival Time | Burst Time |
|---------|--------------|------------|
| P1 | 0 | 6 |
| P2 | 2 | 1 |
| P3 | 3 | 8 |
| P4 | 4 | 3 |

- 3) Consider the following process with their arrival time and burst times, illustrate their execution using SRTF scheduling algorithm. Calculate the ST, WT, FT, TAT, average wait time average turnaround time. Draw the Gantt chart CO2-A

| Process | Arrival Time | Burst Time |
|---------|--------------|------------|
| P1 | 0 | 7 |
| P2 | 1 | 5 |
| P3 | 2 | 2 |
| P4 | 3 | 4 |

- 4) Give the following process with their arrival time, burst time and priority levels, illustrate using the priority scheduling algorithm (non-pre-emptive) calculate ST, WT, FT, TAT average wait time average turnaround time draw the Gantt chart CO2-A

| Process | Arrival Time | Burst Time | Priority |
|---------|--------------|------------|------------|
| P1 | 0 | 4 | 2 |
| P2 | 1 | 2 | 1(Highest) |
| P3 | 2 | 1 | 3 |
| P4 | 3 | 3 | 4 |

- 5) Discuss how reader writer problem can be solved using locks algorithm CO2-U

- 6) Explain pre-emptive and non-pre-emptive scheduling CO2-U
- Q.3) Attempt the following (Any 4)** **20M**
- 1) Explain in brief demand paging CO3-U
 - 2) Write a note on copy-on-write CO3-R
 - 3) Write a short note on FCFS page replacement CO3-U
 - 4) Explain the concept of system mounting CO3-U
 - 5) Explain virtual file system CO3-U
 - 6) Explain the disk structure CO3-U

- Q.4) Attempt the following (Any 5)** **15M**
- 1) Give the following process with arrival times and burst time. CO2-A
 Illustrate using FCFS scheduling algorithm Draw the Gantt chart and calculate start time.

| Process | Arrival Time | Burst Time |
|---------|--------------|------------|
| P1 | 0 | 4 |
| P2 | 1 | 6 |
| P3 | 3 | 2 |
| P4 | 5 | 3 |

- 2) Consider the following process with arrival times and burst time. CO2-A
 Illustrate their execution using the round robin scheduling algorithm with time quantum of 2 MilliSeconds. Draw the Gantt chart and calculate start time.

| Process | Arrival Time | Burst Time |
|---------|--------------|------------|
| P1 | 0 | 5 |
| P2 | 1 | 3 |
| P3 | 2 | 8 |
| P4 | 3 | 6 |

- 3) Explain the concept of free space management CO3-U
- 4) Write a short note on swapping CO3-R
- 5) Explain page replacement LRU algorithm CO3-U
- 6) Define process and discuss its various states CO1-R
