# GUJARAT TECHNOLOGICAL UNIVERSITY
## B.VOC - SEMESTER– I EXAMINATION – SUMMER 2024

**Subject Code: 21110204**                                    **Date:31-05-2024**
**Subject Name: Operating System**
**Time:02:30 PM TO 04:30 PM**                              **Total Marks:50**

**Instructions:**
1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.

| | | | Marks |
|---|---|---|---|
| **Q.1** | **(a)** | List and explain types of OS in detail. | 05 |
| | **(b)** | Differentiate Compiler, Interpreter and Assembler. | 05 |
| | | | |
| **Q.2** | **(a)** | Define process. Draw and explain the process state model. | 05 |
| | **(b)** | Consider the following set of processes with the length of the CPU burst time given in milliseconds. | 05 |

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

Draw the Gantt chart illustrating the execution of these processes using FCFS scheduling. Calculate turn-around time and waiting time for each process.

**OR**

**(b)** Apply Round Robin Scheduling algorithm on given processes with Time Quanta 2.                 **05**

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

| | | | |
|---|---|---|---|
| **Q.3** | **(a)** | Explain Paging technique in memory management with diagrams. | 05 |
| | **(b)** | A process references pages in the following order: | 05 |

1, 2, 3, 4, 5, 3, 4, 1, 6, 7, 8, 7, 8, 9, 5, 4, 2, 4, 9
Use the FIFO and LRU algorithm to find out the number of page faults for this reference string using 3 page frames.

**OR**

| | | | |
|---|---|---|---|
| **Q.3** | **(a)** | Differentiate Internal and External Fragmentation. | 05 |
| | **(b)** | Apply and explain the concept of Demand Paging with page fault in memory management using given example 7, 0, 1, 2, 0, 3, 0, 4, 2, 3, 0, 3, 2, 1, 2, 0, 1, 7, 0, 1. | 05 |

| | | | |
|---|---|---|---|
| **Q.4** | **(a)** | Explain different types of file access methods. | **05** |
| | **(b)** | List and explain disk scheduling algorithms with examples. | **05** |

**OR**

| | | | |
|---|---|---|---|
| **Q.4** | **(a)** | Explain various Directory Structures with diagrams. | **05** |
| | **(b)** | Apply FCFS Disk Scheduling algorithm on following requests. There are a total 100 cylinders and the head is currently on cylinder number 25, 47, 90, 85, 60, 15, 65, 30 | **05** |

| | | | |
|---|---|---|---|
| **Q.5** | **(a)** | Explain following UNIX Commands: pwd, cd, mkdir, ls, rmdir | **05** |
| | **(b)** | Write a short note on antivirus. | **05** |

**OR**

| | | | |
|---|---|---|---|
| **Q.5** | **(a)** | Explain any two mobile operating systems. | **05** |
| | **(b)** | Explain Disk Cleanup, Disk Defragmenter and Backup in detail. | **05** |

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