

**GUJARAT TECHNOLOGICAL UNIVERSITY**  
**BE- SEMESTER-IV (NEW) EXAMINATION – WINTER 2020**

**Subject Code:3140702****Date:09/02/2021****Subject Name:Operating System****Time:02:30 PM TO 04:30 PM****Total Marks:56****Instructions:**

1. Attempt any **FOUR** questions out of **EIGHT** questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- |            |  | <b>Marks</b> |              |            |    |   |    |    |   |   |    |   |   |    |   |   |  |
|------------|--|--------------|--------------|------------|----|---|----|----|---|---|----|---|---|----|---|---|--|
| <b>Q.1</b> | (a) Explain structure of Operating System.   | <b>03</b>    |              |            |    |   |    |    |   |   |    |   |   |    |   |   |  |
|            | (b) Draw and explain five state Process State Transition Diagram.  | <b>04</b>    |              |            |    |   |    |    |   |   |    |   |   |    |   |   |  |
|            | (c) Solve following example by FCFS and SJF CPU scheduling algorithm. Draw Gantt Chart and calculate Average Waiting Time and Average Turnaround time.   | <b>07</b>    |              |            |    |   |    |    |   |   |    |   |   |    |   |   |  |
|            | <table border="1" style="border-collapse: collapse; width: 100%;"> <thead> <tr> <th style="width: 33%;">Process</th> <th style="width: 33%;">Arrival Time</th> <th style="width: 33%;">Burst Time</th> </tr> </thead> <tbody> <tr> <td>P0</td> <td>0</td> <td>10</td> </tr> <tr> <td>P1</td> <td>1</td> <td>6</td> </tr> <tr> <td>P2</td> <td>3</td> <td>2</td> </tr> <tr> <td>P3</td> <td>5</td> <td>4</td> </tr> </tbody> </table> | Process      | Arrival Time | Burst Time | P0 | 0 | 10 | P1 | 1 | 6 | P2 | 3 | 2 | P3 | 5 | 4 |  |
| Process    | Arrival Time   | Burst Time   |              |            |    |   |    |    |   |   |    |   |   |    |   |   |  |
| P0         | 0  | 10           |              |            |    |   |    |    |   |   |    |   |   |    |   |   |  |
| P1         | 1  | 6            |              |            |    |   |    |    |   |   |    |   |   |    |   |   |  |
| P2         | 3  | 2            |              |            |    |   |    |    |   |   |    |   |   |    |   |   |  |
| P3         | 5  | 4            |              |            |    |   |    |    |   |   |    |   |   |    |   |   |  |
| <b>Q.2</b> | (a) State features of distributed operating system.  | <b>03</b>    |              |            |    |   |    |    |   |   |    |   |   |    |   |   |  |
|            | (b) Explain principle of concurrency in brief.   | <b>04</b>    |              |            |    |   |    |    |   |   |    |   |   |    |   |   |  |
|            | (c) Explain Dining philosopher problem and its solution using semaphore.   | <b>07</b>    |              |            |    |   |    |    |   |   |    |   |   |    |   |   |  |
| <b>Q.3</b> | (a) Explain pure virtualization in brief.  | <b>03</b>    |              |            |    |   |    |    |   |   |    |   |   |    |   |   |  |
|            | (b) What is deadlock? List the conditions that lead to deadlock.   | <b>04</b>    |              |            |    |   |    |    |   |   |    |   |   |    |   |   |  |
|            | (c) State the need of demand paging. Explain the steps to handle a page fault using demand paging.   | <b>07</b>    |              |            |    |   |    |    |   |   |    |   |   |    |   |   |  |
| <b>Q.4</b> | (a) Explain Access Control List in brief.  | <b>03</b>    |              |            |    |   |    |    |   |   |    |   |   |    |   |   |  |
|            | (b) Write a Shell script to find Factorial of a given number.  | <b>04</b>    |              |            |    |   |    |    |   |   |    |   |   |    |   |   |  |
|            | (c) Disk requests come in to the disk driver for cylinders 10, 22, 20, 2, 40, 6, and 38, in that order. A seek takes 6 msec per cylinder moved. How much seek time is needed for<br>(a) First-come, first served.<br>(b) Closest cylinder next.<br>In all cases, the arm is initially at cylinder 20.  | <b>07</b>    |              |            |    |   |    |    |   |   |    |   |   |    |   |   |  |
| <b>Q.5</b> | (a) Explain different services provided by operating system.   | <b>03</b>    |              |            |    |   |    |    |   |   |    |   |   |    |   |   |  |
|            | (b) Explain process control block with diagram.  | <b>04</b>    |              |            |    |   |    |    |   |   |    |   |   |    |   |   |  |
|            | (c) Explain Thread Scheduling with suitable example.   | <b>07</b>    |              |            |    |   |    |    |   |   |    |   |   |    |   |   |  |
| <b>Q.6</b> | (a) Give the difference between multitasking OS and multiprogramming OS.   | <b>03</b>    |              |            |    |   |    |    |   |   |    |   |   |    |   |   |  |
|            | (b) Explain Mutual Exclusion in brief.   | <b>04</b>    |              |            |    |   |    |    |   |   |    |   |   |    |   |   |  |

- (c) Explain producer-consumer problem and solve it using semaphore. **07**  
Write pseudo code for the same.
- Q.7** (a) Explain need of Virtual Machines. **03**  
(b) How Resource Trajectories can be helpful in avoiding the deadlock? **04**  
(c) Given memory partitions of 100 KB, 500 KB, 200 KB, 300 KB and 600 KB (in order), how would each of the first-fit, best-fit and worst-fit algorithms place processes of 212 KB, 417 KB, 112 KB and 426 KB (in that order) ? Which algorithm makes the most efficient use of memory? **07**
- Q.8** (a) Write a note on Generic Security Attacks. **03**  
(b) Explain Unix Commands – grep, sort, cat, chmod. **04**  
(c) Explain RAID level system in detail. **07**

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