

**GUJARAT TECHNOLOGICAL UNIVERSITY****BE - SEMESTER-IV (NEW) EXAMINATION – SUMMER 2021****Subject Code:3140702****Date:03/09/2021****Subject Name:Operating System****Time:02:30 PM TO 05:00 PM****Total Marks: 70****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.

- Q.1** (a) Define the essential properties of the following types of operating systems: **03**  
(1) Batch (2) Time-sharing (3) Real-time
- (b) What are the advantages of multiprogramming? **04**
- (c) What is the thread? What are the difference between user-level threads and kernel-supported threads? Under what circumstances is one type “better” than the other? **07**
- Q.2** (a) What is Process? Give the difference between a process and a program. **03**
- (b) What is Process State? Explain different states of a process with various queues generated at each stage. **04**
- (c) Write a bounded-buffer monitor in which the buffers (portions) are embedded within the monitor itself. **07**
- OR**
- (c) What is Semaphore? Give the implementation of Readers-Writers Problem using Semaphore. **07**
- Q.3** (a) Define the difference between preemptive and nonpreemptive scheduling. **03**
- (b) What are the Allocation Methods of a Disk Space? **04**
- (c) What is deadlock? Explain deadlock prevention in detail. **07**
- OR**
- Q.3** (a) What are the disadvantages of FCFS scheduling algorithm as compared to shortest job first (SJF) scheduling? **03**
- (b) Distinguish between CPU bounded, I/O bounded processes. **04**
- (c) What is deadlock? Explain deadlock Avoidance in detail. **07**
- Q.4** (a) What is Access control? **03**
- (b) What are Pages and Frames? What is the basic method of Segmentation? **04**
- (c) Briefly explain and compare, fixed and dynamic memory partitioning schemes. **07**
- OR**
- Q.4** (a) Explain difference between Security and Protection? **03**
- (b) Differentiate external fragmentation with internal fragmentation. **04**
- (c) Explain the best fit, first fit and worst fit algorithm. **07**
- Q.5** (a) Explain the concept of virtual machines. **03**
- (b) Compare virtual machine and non virtual machine. **04**
- (c) What is “inode”? Explain File and Directory Management of Unix Operating System. **07**
- OR**
- Q.5** (a) What is marshalling and unmarshalling? **03**
- (b) What are components of Linux systems? **04**
- (c) Explain Disk arm scheduling algorithm. **07**

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