

**GUJARAT TECHNOLOGICAL UNIVERSITY****BE- SEMESTER-IV (NEW) EXAMINATION – WINTER 2024****Subject Code:3141601****Date:19-11-2024****Subject Name: Operating System and Virtualization****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) Explain the issues involved in Round Robin scheduling if the time quantum is too short and time quantum is too long? **03**
- (b) Write four principal events those create the process. **04**
- (c) Explain the memory management algorithm (i) first fit (ii) next fit (iii) best fit (iv) worst fit **07**
- Q.2** (a) Explain virtualization concept in Android Virtual machine. **03**
- (b) Write C-SCAN disk scheduling algorithm. **04**
- (c) Explain paging – technique used by virtual memory systems. **07**
- OR**
- (c) Explain segmentation – how to provide machine with completely independent address spaces. **07**
- Q.3** (a) Define File Descriptor. Differentiate between Block special File and Character Special File. **03**
- (b) Consider five jobs, A through E with run times 2,4,1,1 and 1 respectively. Their arrival times are 0,0,3,3,3. Calculate the average waiting time if jobs are run in order B,C,D,E and A. **04**
- (c) Differentiate between a process and a thread. Explain the thread model in Operating System. **07**
- OR**
- Q.3** (a) Differentiate between Multiprogramming, Multitasking and time sharing operating system. **03**
- (b) There are four jobs A,B,C,D with run times 8,4,4 and 4 minutes, respectively. Calculate the average turnaround time considering them in the order A->B->C->D and considering shortest job first. **04**
- (c) Describe three methods for doing I/O in Operating System. **07**
- Q.4** (a) Define the role of kernel in UNIX/LINUX operating system. **03**
- (b) Write the conditions which terminate the processes. **04**
- (c) Explain Peterson's solution. **07**
- OR**
- Q.4** (a) Explain Directory structure in UNIX/LINUX operating system. **03**
- (b) Write the four conditions that must hold for there to be a resource deadlock. **04**
- (c) What is a Producer Consumer Problem? How to Solve Producer-Consumer problem using Semaphore? **07**
- Q.5** (a) How virtualization supports multiple operating systems simultaneously on a single hardware platform? **03**
- (b) Describe different process states. Explain the transitions between these states. **04**
- (c) Explain the difference between FIFO and LRU page replacement policy. **07**
- OR**
- Q.5** (a) Which two types of resources are available in operating system? **03**
- (b) Write SCAN disk scheduling algorithm. **04**
- (c) Explain Banker's algorithm with suitable example. **07**

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