

**GUJARAT TECHNOLOGICAL UNIVERSITY**  
**M.SC (IT)- INTEGRATED– SEMESTER III- EXAMINATION –WINTER-2023**

**Subject Code:1330503****Date: 04/12/2023****Subject Name: Operating System****Time: 10:30 AM TO 01:00 PM****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make Suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Use of simple calculators and non-programmable scientific calculators are permitted.

- Q.1** (a) Explain the essential properties of the Batch system and Time sharing system. **03**  
 (b) What is Virtual Machine and give advantages of VM. **04**  
 (c) Define OS. Explain the different types of operating system. **07**

- Q.2** (a) What is a Semaphore in OS and Explain with its types? **03**  
 (b) Discuss in brief different types of scheduler **04**  
 (c) Define Process. Draw and explain different types of process states. **07**

OR

- (c) Explain round robin processing scheduling algorithm with suitable example **07**

- Q.3** (a) Describe mutual exclusion in detail. **03**  
 (b) What Critical section Problem and list the requirements to solve it. **04**  
 (c) What is deadlock? Explain deadlock with example and diagram. **07**

OR

- Q.3** (a) Write advantages and disadvantages of basic paging method. **03**  
 (b) Describe swapping of memory management. **04**  
 (c) Explain deadlock avoidance and banker's algorithm with the help of an example. **07**

- Q.4** (a) Explain memory management with fixed partition. **03**  
 (b) What is thread ? Explain Thread in detail. **04**  
 (c) Explain segmentation in detail. **07**

OR

- Q.4** (a) Explain memory management with dynamic partition. **03**  
 (b) Explain multithreading in detail. **04**  
 (c) Write a short note on page replacement policies. **07**

- Q.5** (a) What is the difference between logical I/O and device I/O? **03**  
 (b) Explain the following four unix commands: cat, ls, cp, wc. **04**  
 (c) Explain Disk structure in OS. **07**

OR

- Q.5** (a) Explain Disk Management in OS. **03**  
 (b) Explain the following four unix commands: pwd, mkdir, grep, echo. **04**

- (c) What is Disk scheduling? Explain the algorithms for disk Scheduling. **07**

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