Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

MCA INTEGRATED– SEMESTER -IV EXAMINATION –WINTER-2021

Subject Code: 4440603 **Date: 28/12/2021**

Subject Name: Operating Systems

Time: 02:30 PM TO 5:00 PM **Total Marks: 70**

Instructions:

1. **Attempt all questions.**
2. **Make Suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q.1 **(a)** Define the following terms. **07**

1) Thrashing
2) Virtual Memory Management
3) Weak Semaphore
4) Realtime Operating System
5) Preemptive Scheduling
6) Secondary storage methods
7) Interrupt

(b) What is Process? List and explain the different reasons for process creation. **07**

Q.2 **(a)** What is multithreading? Explain in brief KLT and ULT with its advantages and disadvantages, **07**

(b) What is Monitor? Explain the solution to the Bounded-Consumer problem using a monitor **07**

OR

(b) Write a short note on Banker's Algorithm with suitable example. **07**

Q.3 **(a)** Discuss the use of Invert Page Table in paging technique. How physical address is generated in it? **07**

(b) When and how the short-term, medium-term and long-term scheduling policies are applied? Draw the queuing diagram for scheduling **07**

OR

Q.3 **(a)** Define virtual memory. Compare LRU, FIFO and Clock page replacement policies with suitable example. **07**

(b) Write any three differences between preemptive and non-preemptive scheduling? Explain the four general approaches for thread scheduling. **07**

Q.4 **(a)** Briefly explain any three methods of file allocation and compare them all. **07**

(b) Write short note:

1. Distributed message passing **04**
2. Middleware **03**

OR

Q.4 **(a)** Write Short Note:

1) Gang Scheduling **03**
2) RAID **04**

(b) What is I/O Communication? Explain I/O Communication Techniques in detail. **07**

Q.5 **(a)** What are the characteristics of RAID? Explain RAID Level 0 & RAID Level 1. **07**

(b) Explain different types of security threats. **03**

Explain three-tier client/server architecture. **04**

OR

Q.5 **(a)** What is dynamic partitioning? Explain first-fit, best-fit, next-fit placement policies and buddy system using suitable examples. **07**

(b) Explain the term Clusters. What benefits can be availed by using Clusters? Compare different Clustering Methods. **07**

****