Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

MCA INTEGRATED – SEMESTER IV – EXAMINATION – SUMMER 2021

Subject Code: 4440603 **Date: 20/09/2021**

Subject Name: Operating Systems

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.**

Q.1 **(a)** Explain the following: **(7)**

1. Data Integrity
2. Dispatcher
3. Granularity
4. Critical Section
5. Race Condition
6. No Preemption
7. Turnaround time

(b) What is Operating system? Explain in brief objectives and functions of OS. **(7)**

Q.2 **(a)** i) Define Multithreading with example. **(3)**

ii) Write four differences between process and thread. **(4)**

(b) What is process? Explain the process state transition diagram with suspend state. **(7)**

OR

(b) What is multithreading? Explain in brief KLT and ULT with its advantages and disadvantages. **(7)**

Q.3 **(a)** State Producer/Consumer problem. How it is different from Readers/Writer problem. **(7)**

(b) i) Discuss 4 necessary conditions for deadlock. **(2)**

ii) Explain in brief Deadlock avoidance with its advantages and disadvantages **(5)**

OR

Q.3 **(a)** What is semaphore? Give and explain the algorithm of producer/consumer problem with bounded using general semaphore. **(7)**

(b) i) Give examples of reusable and consumable resources. **(3)**

ii) List two ways in which the No-preemption condition can be prevented. **(4)**

Q,4 **(a)** What is segmentation? How it differs with paging? Explain address translation in segmentation with paging. **(7)**

(b) Describe FCFS, RR, SPN, SRT, HRRN, Feedback and Fair-share scheduling methods briefly. **(7)**

OR

Q,4 **(a)** Define virtual memory. Compare LRU, FIFO and Clock page replacement policies with suitable example. **(7)**

(b) Write short note: **(7)**

i) Gang Scheduling ii) SCAN and FIFO Disk Scheduling algorithm

Q.5 **(a)** How do you classify the different approaches for Real-time scheduling? State various Real-time scheduling techniques available and discuss any one in detail. **(7)**

(b) Name the File allocation methods available in File Management. Explain in detail all methods. **(7)**

OR

Q.5 **(a)** Explain RAID and its level 0-6 in detail. **(7)**

(b) Define client server computing and explain the classes of client server applications and compare it with three tire architecture. **(7)**

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