Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

MCA - SEMESTER– II EXAMINATION – WINTER 2018

Subject Code: 3620003 Date: 05-01-2019

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: (Any Seven) **07**

1. Monitor
2. Multitasking
3. Interrupts
4. Response time
5. Memory fault
6. Busy waiting or Spin waiting
7. Dispatcher
8. Jacketing

(b) Explain Seven-state Process Models mentioning all the transitions. **07**

Q.2 **(a)** i) Explain principles of concurrency with the help of suitable example. **05**

ii) Define Thrashing **02**

(b) i) Differentiate between Process and Thread. **04**

ii) Explain Resource Allocation Graph and its usage with example. **03**

OR

(b) i) What is Deadlock? Discuss the necessary and sufficient conditions for a Deadlock to occur. **03**

ii) Define semaphore with its' three operations. Define also binary semaphore. **04**

Q.3 **(a)** Define Paging. Explain the logical to physical address translation mechanism in paging with example. **07**

(b) Explain Banker's algorithm with example. **07**

OR

Q.3 **(a)** What is Translation Lookaside Buffer? Explain the working of TLB with flowchart. **07**

(b) Explain Dining Philosopher Problem. Give a solution using Monitor. **07**

Q.4 **(a)** Explain the Readers/Writers problem. Give a solution using semaphore if writers having a priority. **07**

(b) Briefly describe the three types of Processor Scheduling. **07**

OR

Q.4 **(a)** Total No of pages for the process are 5 and total number of frames allocated to this process are 3 (using Fixed frame allocation). **07**

The page address stream formed by executing the program is as follows:
(2 3 2 1 5 2 4 5 3 2 5 2)
Judge which page replacement algorithm among OPT, LRU and FIFO works better. Provide your justification for the same.

(b) Discuss Direct Memory Access (DMA) for performing I/O. **07**

Q.5 **(a)** i) Define File Management System. **03**

ii) Explain FIFO and SSTF disk scheduling algorithm. **04**

(b) Apply (i) Round Robin with quantum = 4 (ii) First come First serve-FCFS (iii) SPN algorithm for the following set of processes. **07**

1. Draw Gantt chart showing execution of these processes.

2. Calculate turnaround time for each process and each algorithm.
3. Calculate waiting time for each process and each algorithm.
4. Calculate finish time for each process and each algorithm.

Process	Arrival Time	Service Time
A	0	3
B	2	6
C	4	4
D	6	5
E	8	2

OR

Q.5 **(a)** What is RAID? Explain various levels of RAID. **07**

(b) Explain fetch policy and replacement policy in memory management. **07**

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