Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

MCA – SEMESTER – II • EXAMINATION – SUMMER 2018

Subject Code: 3620003 **Date: 23-May-2018**

Subject Name: Operating Systems

Time:10.30 am to 1.00 pm **Total Marks: 70**

Instructions: 1. Question No. 1 and 2 A) is compulsory.
2. Give Diagrams wherever necessary.

Q.1. A) **Define the following: (Any Seven)** **7**

1. Multiprogramming.
2. Process
3. Semaphore
4. Critical Section
5. Memory Fault
6. Virtual Memory
7. TLB
8. Dispatcher
9. Mutual Exclusion
10. Context Switching

1. B) 1. What is PCB? List the content of PCB. **4**
2. Explain three main objectives of Operating System. **3**

Q.2. A) Draw the standard seven state transition diagram. Briefly explain each state. **7**

B) 1. Differentiate between Process and Thread. **4**
2. Differentiate between Strong Semaphore and Weak Semaphore. **3**

OR

B) What is semaphore? Explain Solution to producer/consumer problem –infinite Buffer using Binary semaphore. **7**

Q. 3. A) Define Paging. Explain Address Translation mechanism in Paging. **7**

B) List and explain seven levels of RAID. **7**

OR

3. A) Describe the necessary condition for deadlock occurrence. Discuss the deadlock avoidance using Banker's algorithm. **7**

B) Briefly describe the three types of processor scheduling. **7**

Q.4. A) What is Translation Look aside Buffer? Explain the Paging with the use of TLB. **7**

B) Calculate the total number of Page Faults to be generated according to the **FIFO, LRU** and **OPT** Replacement Policy based on the following data: **7**
Total No of pages for the process are 5 and total number of frames allocated to this process are 3 (using Fixed frame allocation)
The page address stream formed by executing the program is as follows:
(2 1 4 2 3 1 5 2 3 5 4 1 3 4).

OR

Q.4. A) Discuss Address translation in Virtual Memory Segmentation mechanism. **7**

4. B) Explain Dining Philosopher Problem. Give a solution using Monitor. **7**

Q. 5. A) Apply 1. Round Robin with quantum 4 2) First come First serve-FCFS 3) SPN algorithm for the following set of processes. **7**

1. Draw Gantt chart showing execution of this 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

B) 1. Explain FIFO and SCAN disk scheduling algorithm. **4**

2. Differentiate between Internal and External Fragmentation. **3**

OR

Q. 5. A) Explain the two broad categories of Threads. **7**

B) 1. What are three contexts in which concurrency arise? **3**

2. Define DMA **2**

3. Define File Management System. **2**

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