Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

MCA Integrated - SEMESTER– IV-EXAMINATION – WINTER 2018

Subject Code: 4440603 Date: 04-12-2018

Subject Name: Operating Systems (OS)

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) Answer following in short. 07

(1) Discuss the possible reasons for process migration.
(2) Define F-SCAN policy.
(3) What is the relation between FIFO and clock page replacement algorithm?
(4) List characteristics of Real time Operating system.
(5) What delay elements are involved in a disk read or write?
(6) What is access time?
(7) Define Race Condition.

(b) Do as Directed 07

1. _____ is a technique for overcoming external fragmentation. (Fill in the Blank)
2. _____ is known as the management of multiple processes within a uni-processor system. (Fill in the Blank)
3. A _____ is a state in which there is at least one sequence of resource allocation to processes that does not result in a deadlock. (Fill in the Blank)

4.
When a program tries to access a page that is mapped in address space but not loaded in physical memory, then -
a) segmentation fault occurs
b) fatal error occurs
c) page fault occurs
d) no error occurs

5.
Which of the following condition is required for deadlock to be possible?
a) mutual exclusion
b) a process may hold allocated resources while awaiting assignment of other resources
c) no resource can be forcibly removed from a process holding it
d) all of the mentioned

6.
First-in-first-out scheduling is
a) Non pre-emptive scheduling
b) Pre-emptive scheduling
c) Fair share scheduling
d) Deadline scheduling

7.
Which one of the following is not a function of Operating System
a) Resource management
b) File management
c) Networking
d) Process management

Q.2	**(a)**	Draw neat seven state Process State Transition diagram. Explain in detail.	**07**
	(b)	Describe the necessary condition for deadlock occurrence. Discuss the deadlock avoidance using Banker's algorithm.	**07**
		OR	
	(b)	What is semaphore? Give and explain the algorithm of producer/consumer Problem with bounded using general semaphore.	**07**
Q.3	**(a)**	What is mutual exclusion? Define Semaphore, the permissible operations with Semaphore and how they are used to achieve the mutual exclusion.	**07**
	(b)	What is segmentation? How it differs with paging? Explain address translation in segmentation with paging.	**07**
		OR	
Q.3	**(a)**	Define Reader/Writer Problem. What are the conditions generally associated with this problem? How can this problem be solved using Semaphores?	**07**
	(b)	(1) Differentiate between Reusable and consumable resources. (2) Discuss Gang Scheduling and Load Sharing with its advantages and Disadvantages.	**03** **04**
Q.4	**(a)**	Briefly explain the different RAID levels. Support your illustrations with neat sketches.	**07**
	(b)	Explain thrashing. What is the purpose of Translation Look aside Buffer? Explain in brief.	**07**
		OR	
Q.4	**(a)**	(i) Explain briefly the three techniques for performing I/O. (ii) What are typical operations that may be performed on a directory?	**07**
	(b)	What do you mean by Page replacement policy? Solve following example using Optimal, LRU, FIFO and Clock polices. Consider a program with five pages and main memory with three page frames. Given below is the page address stream formed by executing the program 2 3 2 1 5 2 4 5 3 2 5 2	**07**
Q.5	**(a)**	Briefly Define FCFS and Round-Robin processor scheduling.	**07**
	(b)	List and Briefly define four techniques for thread scheduling.	**07**
		OR	
Q.5	**(a)**	Explain different classes of Client Server architecture. What do you mean by three tier Client Server architecture?	**07**
	(b)	Write a short note on Distributed Message Passing.	**07**

****