Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER– IV (New) EXAMINATION – WINTER 2019

Subject Code: 2140702 Date: 14/12/2019

Subject Name: Operating System

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.**

MARKS

Q.1 **(a)** Explain Monolithic and Layered system of Operating System Structure. **03**

(b) What is the function of Kernel ? Explain System Calls with Example. **04**

(c) Differentiate: a) paging and fragmentation b) Global and local allocation policies for paging. **07**

Q.2 **(a)** Give the Difference between Thread and Process. **03**

(b) Distinguish Relative path and Absolute Path with an example. **04**

(c) Dining philosopher problem and its solution using semaphore. **07**

OR

(c) Explain producer consumer problem and its solution using monitor. **07**

Q.3 **(a)** Define: a). Context Switching b). Mutual Exclusion c). Race Condition **03**

(b) Explain the state of Process. Also explain fork( ) . **04**

(c) Solve following by SJF preemptive and non-preemptive. Draw Gantt Chart, Average Waiting Time and Average Turnaround Time. Which one is better as per average turnaround time? **07**

Process	Arrival Time	Burst Time
P1	0	7
P2	2	4
P3	4	2
P4	7	1

OR

Q.3 **(a)** What are the necessary conditions for Deadlock to occur? **03**

(b) Consider following page reference string : **04**
7 0 1 2 0 3 0 4 2 3 0 3 2 1 2 0 1 7 0 1
Calculate page faults using LRU and Optimal page replacement algorithm with page frame= 3.

(c) Solve following by Round Robin process scheduling algorithm. Draw Gantt Chart, Average Waiting Time and Average Turnaround Time for time slice=4 and time slice=2. **07**

Process	Arrival Time	Burst Time
P1	0	7
P2	2	4
P3	3	2
P4	9	1

Explain context switching overheads for this problem.

Q.4 **(a)** What is symbolic link and hard link. What is absolute path and relative path. **03**

	(b)	Explain Associative memory and Virtual memory.	**04**
	(c)	Given the following track requests in the disk queue, compute for the Total Head Movement (THM) of the read/write head and seek time needed for a). First come first served b). Shortest seek time first c). SCAN: 95, 180, 34, 119, 11, 123, 62, 64 Consider that the read/write head is positioned at location 50. A seek takes 5ms per cylinder move.	**07**

OR

Q.4	**(a)**	Explain RAID. How it is helpful to increase CPU performance?	**03**
	(b)	Consider following page reference string : 5 4 3 2 5 4 6 5 4 3 2 6 Calculate page faults using FIFO page replacement algorithm with: a) page frame= 3 b) page frame =4. Justify belady's anomaly.	**04**
	(c)	Explain various techniques of Protection mechanism of Operating system.	**07**
Q.5	**(a)**	Explain memory allocation using Buddy System with an example.	**03**
	(b)	Explain various types of file allocation methods.	**04**
	(c)	Make a shell script which copies the content of file1 to file2 without using CP command. It should also check: a) If file1 has read permission, if not then it should print an error message. b) If file1 and file2 are same then send message. c) If file2 exists, it should ask the used whether he wants to overwrite it.	**07**

OR

Q.5	**(a)**	Write a shell script which displays the content of all files given as command line arguments with appropriate heading. It should also give the name of file which are not readable.	**03**
	(b)	Write a shell script which prints "good morning" or "good afternoon" depending on the login time of user. The message should be highlighted with blinking character at some specific position on the screen.	**04**
	(c)	Explain File system backups.	**07**

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