Seat No.: _____ **Enrolment No._____**

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–IV (NEW) - EXAMINATION – SUMMER 2017

Subject Code: 2140702 **Date: 08/06/2017**

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		**Short Questions**	**14**
	1	Define: Starvation	
	2	Suppose that process is in BLOCK state and waiting for some I/O services when service is completed, it goes to the _____ state.	
	3	_____ is called lightweight process.	
	4	Define: Best fit	
	5	If machine is a 32 bit machine with a page size of 4 KB, then find out page number and page offset.	
	6	Define : Device driver	
	7	SCSI stands for _____	
	8	Define: rotational latency	
	9	Page size is always in power of 2. (True / False)	
	10	FAT stands for _____	
	11	Give the name of operation that can be performed on semaphore.	
	12	Give the name of technique used for overcoming external fragmentation.	
	13	Define: Critical section	
	14	Logical address are generated by CPU. (True / False)	
Q.2	**(a)**	Explain different service provided by operating system.	**03**
	(b)	Explain the features of Time sharing system.	**04**
	(c)	What is operating system? Give the view of OS as a resource manager.	**07**
		OR	
	(c)	What is system call? Explain steps for system call execution.	**07**
Q.3	**(a)**	What is interrupt? How it is handle by operating system.	**03**
	(b)	Explain process control block with diagram.	**04**
	(c)	Explain process states model with diagram.	**07**
		OR	
Q.3	**(a)**	Difference between process and thread.	**03**
	(b)	What is scheduler? Explain queuing diagram representation of process scheduler with figure	**04**
	(c)	Consider the following five processes with the length of the CPU burst time in milliseconds.	**07**

Process	Burst Time	Priority
P1	10	3
P2	1	1
P3	2	3
P4	1	4
P5	5	2

Processes are Assumed to have arrived at time 0.

For the above set of processes find the average waiting time and average around time for each of the following scheduling algorithm using Gantt chart. Consider 1 is highest priority.

1. SJF
2. Non preemptive Priority
3. RR (Q = 2)

Q.4 **(a)** Explain link list method for dynamic memory management. **03**

(b) Explain multiprogramming with fixed partition. **04**

(c) What is Paging? Explain paging mechanism in MMU with example. **07**

OR

Q.4 **(a)** Write a short note on DMA. **03**

(b) Explain TLB mechanism for speed up the process of paging. **04**

(c) Consider the following reference string. Calculate the page fault rates for below page replacement algorithm. Assume the memory size is 4 page frame. **07**

1,2,3,4,5,3,4,1,6,7,8,7,8,9,7,8,9,5,4,5,4,2

1. FIFO
2. OPTIMAL

Q.5 **(a)** What is Mutual exclusion? Explain Peterson's solution for mutual exclusion problem. **03**

(b) What is "inode"? Explain File and Directory Management of Unix Operating System. **04**

(c) Suppose Disk drive has 300 cylinders. The current position of head is 90. The queue of pending request is **07**

36,79,15,120,199,270,89,170

Calculate head movement for the following algorithms.

1. FCFS 2. SSTF

OR

Q.5 **(a)** Explain Unix Commands: cat, sort, grep. **03**

(b) What is Deadlock? List the conditions that lead to deadlock. How Deadlock can be prevented? **04**

(c) What is Semaphore? Give the implementation of Bounded Buffer Producer Consumer Problem using Semaphore. **07**

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