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GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–IV (NEW) EXAMINATION – WINTER 2018

Subject Code: 2140702 **Date:10/12/2018**

Subject Name: Operating System

Time: 02:30 PM TO 05:00 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)**	Define following 1) Interrupt 2) Thrashing 3) Race Condition	**03**
	(b)	Define and differentiate process and thread.	**04**
	(c)	What is operating system? Discuss role/functions of OS as a resource manager.	**07**
Q.2	**(a)**	What is mutual exclusion? List out various methods/approach to achieve it.	**03**
	(b)	What do you mean by scheduling? Discuss in brief types of scheduler.	**04**
	(c)	Explain process state model with diagram.	**07**
		OR	
	(c)	List out types of operating system and explain batch OS and time sharing OS in brief.	**07**
Q.3	**(a)**	What is Belady's anomaly? Explain with suitable example.	**03**
	(b)	What is TLB? Explain how it speeds up the overall processing.	**04**
	(c)	What is Paging? Explain paging mechanism in MMU with example.	**07**
		OR	
Q.3	**(a)**	What is virtual memory? What are advantages of it?	**03**
	(b)	Explain multiprogramming with fixed partition.	**04**
	(c)	Calculate the page fault rates for below reference string in case of FIFO and Optimal page replacement algorithm. Assume the memory size is 4 page frames and all frames are initially empty. 0,2,1,6,4,0,1,0,3,1,2,1	**07**
Q.4	**(a)**	Write a short note on DMA.	**03**
	(b)	What is deadlock? Describe in brief necessary conditions that should hold for deadlock to occur.	**04**
	(c)	Consider the processes P1, P2, P3, P4 given in the below table, arrives for execution in the same order, with arrival time 0, and given burst time, draw GANTT chart and find the average waiting time using the FCFS and SJF scheduling algorithm.	**07**

Process	Burst Time
P1	21
P2	3
P3	6
P4	2

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OR

Q.4	**(a)**	What do you mean by fragmentation? Differentiate internal and external fragmentation.	**03**
	(b)	List approaches to deal with deadlock. Explain deadlock prevention in brief.	**04**
	(c)	What do you mean by mutual exclusion? Explain Peterson's solution for mutual exclusion problem.	**07**
Q.5	**(a)**	List and explain different file attributes.	**03**
	(b)	What is I-node? Explain in brief.	**04**
	(c)	Define seek time and rotational latency. Assume that a disk drive has 200 cylinders, numbered 0 to 199. The drive is currently serving a request at cylinder 100. The queue of pending requests is 23, 89, 132, 42, 189. Calculate seek time for FCFS and SSTF disk scheduling algorithm.	**07**

OR

Q.5	**(a)**	Differentiate contiguous and linked file allocation methods.	**03**
	(b)	Explain Unix Commands – grep, sort, cat, chmod	**04**
	(c)	What do you mean by security? Discuss in brief access control list.	**07**

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