Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

ME - SEMESTER–I(New course)• EXAMINATION – WINTER- 2015

Subject Code: 2715402 **Date: 31/12/2015**

Subject Name: Real Time Operating System Fundamentals

Time:2:30 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)**	Compare 'Superloop without interrupt' architecture with 'Superloop with interrupt' architecture.	**07**
	(b)	Explain functional and non-functional requirements of an RTOS.	**07**
Q.2	**(a)**	What is user space and kernel space in RTOS?	**07**
	(b)	Explain the processes and threads.	**07**
		OR	
	(b)	What is concurrency? How operating system helps to achieve concurrency?	**07**
Q.3	**(a)**	What is Job Queue, Ready Queue and Device Queue? How process transition occurs within these queues?	**07**
	(b)	Explain the state transition diagram of process.	**07**
		OR	
Q.3	**(a)**	What is reentrant function? What care one should take while writing reentrant function?	**07**
	(b)	Explain the Kernel services offered by an RTOS.	**07**
Q.4	**(a)**	What condition can lead to starvation in SJF scheduling? Which strategies can be used to overcome starvation problem?	**07**
	(b)	Explain Binary semaphore and Counting semaphore with an application of each.	**07**
		OR	
Q.4	**(a)**	Explain priority inversion problem in detail. Also suggest the possible solutions to solve priority inversion.	**07**
	(b)	What is Deadlock? Explain Coffman Conditions in details which lead to deadlock.	**07**
Q.5	**(a)**	Justify with reasoning "In certain cases of schedulable task set RMS algorithm fails but EDF algorithm always works".	**07**
	(b)	Explain task communication mechanisms : Mailbox and Signaling	**07**
		OR	
Q.5	**(a)**	What is event driven scheduling and time driven scheduling? List out different scheduling mechanism of each type.	**07**
	(b)	How to solve The Dining Philosophers' Problem?	**07**

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