Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

ME – SEMESTER-1 (NEW) EXAMINATION – WINTER 2016

Subject Code: 2715402 **Date:03/01/2017**

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)**	How firmware design plays an important role in design of a real time system?	**07**
	(b)	Explain Hard Real Time System, Soft Real Time System and Firm Real Time system with suitable example of each.	**07**
Q.2	**(a)**	What is process? How process management is achieved in kernel?	**07**
	(b)	What is race condition? How race condition can be solved?	**07**
		OR	
	(b)	Explain POSIX threads.	**07**
Q.3	**(a)**	Explain the following terms: Implicit Deadline, Jitter & Sporadic Task.	**07**
	(b)	Explain different scheduling scenarios when a process starves for CPU.	**07**
		OR	
Q.3	**(a)**	Explain conditions which leads to deadlock.	**07**
	(b)	What care one must take while creating reentrant function?	**07**
Q.4	**(a)**	How binary semaphore and counting semaphore is used in an operating system?	**07**
	(b)	Compare pipe and message queue mechanism.	**07**
		OR	
Q.4	**(a)**	Explain priority inheritance and priority ceiling.	**07**
	(b)	Explain mechanism by which processes running in different cores can communicate with each other.	**07**
Q.5	**(a)**	Consider three real time tasks A, B and C having execution time (ms) 1, 1, 0.5 and period (ms) 2, 4, 6 respectively. Check if these tasks are schedulable or not. Try to schedule these tasks with EDF algorithm for first 20ms. Assume all tasks are in ready state when system starts execution.	**07**
	(b)	Explain how process transition occurs between ready queue, job queue and device queue	**07**
		OR	
Q.5	**(a)**	Compare EDF and RMS scheduling algorithms.	**07**
	(b)	What parameters one should consider while selection Real Time Operating System?	**07**

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