GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER–VII (OLD) EXAMINATION – WINTER 2018

Subject Code: 171005   **Date: 15/11/2018**

Subject Name: Embedded Systems

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.

Q.1	**(a)**	Explain difference between general purpose microprocessor and ARM processor. Explain architecture of ARM7TDMI processor.	**07**
	(b)	Discuss RISC design philosophy and features of RISC system.	**07**
Q.2	**(a)**	Discuss ARM programmer's model. What are the ARM development tools available?	**07**
	(b)	Explain control flow instructions of ARM processor with example.	**07**
		OR	
	(b)	Explain concept of pipeline used in ARM processor. Explain three stage pipeline used in ARM7TDMI processor.	**07**
Q.3	**(a)**	Explain concept of delayed branch. Why FIQ response is fast in ARM processor compared to IRQ?	**07**
	(b)	Explain following assembly language instructions for ARM processor: LDMIA R0!,{R1-R7} (2) MOV R1,R2,LSL #3 (3) TST R2,R3	**07**
		OR	
Q.3	**(a)**	Design a table that compares maximum operational speed, bus length and two application examples of (1) UART (2) CAN (3) I2C and (4) SPI serial devices.	**07**
	(b)	Define context, interrupt latency and interrupt service deadline. What is context switching?	**07**
Q.4	**(a)**	What are the parameters at a TCB of task? Why should each task have distinct TCB?	**07**
	(b)	Define critical section of task. What are the ways by which critical section run by blocking other processes.	**07**
		OR	
Q.4	**(a)**	What is the difference between soft real time and hard real time systems? What are the precautions required in hard real time system design. Give examples of soft real time and hard real time systems.	**07**
	(b)	What are the features of P and V semaphores? How they are used as a resource key, as a counting semaphore and as a mutex?	**07**
Q.5	**(a)**	Explain earliest deadline first (EDF) precedence and rate monotonic schedulers (RMS) model.	**07**
	(b)	What is the importance of device management in operating system for embedded systems? Discuss OS security issues for embedded systems.	**07**
		OR	
Q.5	**(a)**	What is bus arbitration? What are the methods used for bus arbitration?	**07**
	(b)	Explain advantages of internet-enabled embedded systems. What are the protocols used for internet-enabled embedded system?	**07**

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