Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VII EXAMINATION – WINTER 2015

Subject Code: 171005 **Date:04/12/2015**

Subject Name: Embedded Systems

Time: 10:30am to 1:00pm **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)** Describe skills required in embedded system designer and list applications of embedded systems. **07**

(b) Answer the following questions **07**

[1] How many general purpose registers are there in ARM7TDMI?
[2] What is the difference between CPSR and SPSR?
[3] What is mode switching?
[4] Why FIQ uses separate set of registers?
[5] What is the vector location of software interrupt (SWI)?
[6] What is the Special function of register R13 in ARM?
[7] What will be content of R1 after executing instructions:
MOV R2,#08h, MOV R1,R2,LSL #2

Q.2 **(a)** Write 'C' or assembly language program to generate square wave from port pin P1.0 in ARM7TDMI chip. **07**

(b) Compare RISC and CISC processors. What are the features of RISC accepted in ARM and what are the features rejected in ARM? Why those features are rejected? **07**

OR

(b) Write assembly language program to calculate value of S in equation S=8X+2Y+Z. Assume any value of X, Y and Z. Use ARM registers to store values of X, Y, Z and S variables. **07**

Q.3 **(a)** Explain following ARM instructions **07**

[1] MVN R0,R9 [2] LSR R2,#4 [3] ROR R1,R2 [4] MOV R1,R2,LSL #2
[5] MOVEQ R1,R2 [6] SUBS R3,R2,R1 [7] TST R3,R4

(b) Explain branch instructions of ARM processor with example **07**

OR

Q.3 **(a)** What is semaphore? Explain counting semaphore and binary semaphore. **07**

(b) What is deadlock? What are the methods available to handle deadlock situation? **07**

Q.4 **(a)** Discuss qualities of good real time operating system (RTOS). Give example of two systems which needs "real time" capabilities. **07**

(b) Explain Earliest Deadline First Scheduling algorithm with neat sketch and example. Discuss disadvantages of EDF. **07**

OR

Q.4 **(a)** What is inter-process communication? Why it is required? **07**

(b) What is task? Explain different task states and Task Control Block (TCB) data **07**

Q.5 **(a)** Explain I^2C protocol. State use of each control bit of I^2C. **07**

	(b)	Discuss Device communication bus used for communication of controllers used in automobile. How it is different from I^2C.	**07**

OR

Q.5	**(a)**	Explain Watch dog timer and Real time clock. Discuss its importance in embedded systems.	**07**
	(b)	Explain advantages of wireless devices. How wireless devices network using different protocols?	**07**

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