Seat No.: _____ Enrolment No.

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VII (OLD) EXAMINATION – SUMMER 2019

Subject Code: 171005 **Date: 10/05/2019**

Subject Name:Embedded Systems

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.**

Q.1 **(a)** Define the following : **07**

1. Delayed Branch
2. Load - Store Architecture
3. 3 Address Instruction format
4. Thread
5. Leaf Subroutine
6. Soc
7. ASIC

(b) (i) Define and classify the embedded systems with examples of each. **07**
(ii) Describe the flow of ARM development tools for embedded system design.

Q.2 **(a)** Draw the Programmer's Model of ARM Processor. Also Explain CPSR. **07**

(b) Explain in detail ARM 3-stage pipelining with neat Sketch. **07**

OR

(b) Explain in detail ARM 5-stage pipelining with neat Sketch. **07**

Q.3 **(a)** Explain the following ARM instructions with suitable example. **07**
(i) TEQ (ii) STMDB (iii) LDMIA (iv) STMFD (v) ADDEQ
(vi) SWI (vii) BNE

(b) Discuss the Thumb programmer's model of ARM architecture. **07**

OR

Q.3 **(a)** What is Stack. Explain types of stack operation supported by ARM processor along with Instruction use for Stack. **07**

(b) Give the properties of Thumb Operation in ARM processor. Also Explain Thumb entry & Exit Process. **07**

Q.4 **(a)** (i) Compare Watch dog timer and RTC. **07**
(ii) Define 1. Socket 2. Mutex 3. Kernal

(b) Compare the advantages and disadvantages of data transfers using serial and parallel ports devices. Explain in brief I^2C bus protocol. **07**

OR

Q.4 **(a)** List the various states of process/task. Explain them with state transition diagram. **07**

(b) Explain three modes of serial communication, 'synchronous', 'iso-synchronous' and 'asynchronous' using serial devices with one example of each. **07**

Q.5 **(a)** Explain the concept of semaphore used in embedded system software Development. Lists it's types. Give brief about P & V semaphore. **07**

(b) Explain the various methods of saving and optimizing the Power needs in RTOS environment. **07**

OR

Q.5 **(a)** How RTOS manages the memory, give the memory management strategy of RTOS in embedded system design. **07**

(b) Compare cooperative scheduling and pre-emptive scheduling. **07**

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