

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 I²C 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**
