

GUJARAT TECHNOLOGICAL UNIVERSITY**BE- SEMESTER-VII (NEW) EXAMINATION – WINTER 2020****Subject Code:2171005****Date:21/01/2021****Subject Name:Embedded Systems****Time:10:30 AM TO 12:30 PM****Total Marks: 56****Instructions:**

1. Attempt any **FOUR** questions out of **EIGHT** questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

	MARKS
Q.1 (a) Write down the skills required for an Embedded System Designer.	03
(b) Describe the features associated with AHB and ASB Buses.	04
(c) Describe an embedded processor as (i) GPP (ii) ASIP (iii) Single purpose processor.	07
Q.2 (a) Enlist IO port types with the help of example.	03
(b) Explain the concept of Multithreading in Real Time Operating System.	04
(c) Explain the requirements of Software Interrupts (SWI) in Embedded System.	07
Q.3 (a) What is Semaphore? Explain where Semaphore can be utilized?	03
(b) What is the significance of Mailbox in RTOS?	04
(c) Discuss shared data problems and give solutions to such problems.	07
Q.4 (a) Explain difference between level-triggered and edge-triggered interrupts.	03
(b) Describe the features associated with Bluetooth and Zigbee protocols used in wireless and mobile systems.	04
(c) Write down methods of saving and optimizing the memory space.	07
Q.5 (a) Explain the differences between Hard Real time and Soft Real time system.	03
(b) Describe the requirement of Direct Memory Access (DMA) based data transfer in Device driver programming.	04
(c) Write down the functions of Device manager.	07
Q.6 (a) Describe Cyclic Scheduling model with an application.	03
(b) Define following:	04
1. Deadline 2. Runtime 3. Task Precedence 4. Worst case execution time	
(c) Explain any two alternative systems in RTOS for responding to a hardware source calls on the interrupts.	07
Q.7 (a) Explain the function of Watchdog timer in MSP430 processor.	03
(b) Describe the four sources of clock in MSP430 processor.	04
(c) Explain the use of timer for generating Pulse Width Modulated waveform using MSP430.	07
Q.8 (a) Explain the special features associated with GPIO port pins in MSP430 other than simple digital input output port pin characteristics.	03
(b) Write a program to turn on and off an LED connected to GPIO port pin P1.0 with 1ms delay.	04
(c) Explain interrupt handling process in MSP430.	07
