

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VII (NEW) EXAMINATION – SUMMER 2021****Subject Code:2171005****Date:04/08/2021****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.

		MARKS
Q.1	(a) Justify the statement “By decreasing the operating clock at a lower frequency reduces the power loss due to heat generation”.	03
	(b) Discuss the various components of embedded system design.	04
	(c) Explain various interrupt service (handling) mechanism used in embedded system.	07
Q.2	(a) Differentiate serial and parallel communication.	03
	(b) List out four wireless and mobile system protocols.	04
	(c) Explain the requirements of Software Interrupts (SWI) in software part of an Embedded System.	07
OR		
	(c) Illustrate the importance of watchdog timer and real time clock in embedded systems.	07
Q.3	(a) Describe in brief ISR concept.	03
	(b) Define the following terms: 1) Context, 2) Context Switching, 3) Interrupt Latency, and 4) Deadline	04
	(c) Write a brief note on device driver, its functions and programming.	07
OR		
Q.3	(a) Explain following terms: (i) Kernel (ii) TCB (iii) CPU load.	03
	(b) List the various states of process/task.	04
	(c) What is Semaphore? Explain where Semaphore can be utilized? Describe the functions provided by RTOS to utilize it.	07
Q.4	(a) Discuss characteristics of the functions.	03
	(b) Describe co-operative and pre-emptive scheduling.	04
	(c) Enlist service provided by RTOS and RTOS task scheduling models.	07
OR		
Q.4	(a) What will happen if all the tasks are in Wait state? How RTOS will handle such situation?	03
	(b) Describe the functions provided by RTOS in association with Mailbox.	04
	(c) Explain following scheduling policies with their differences. (1) Earliest Deadline First (2) Rate Monotonic Scheduler.	07
Q.5	(a) What is the significance of Mailbox in RTOS?	03
	(b) Describe the four sources of clock in MSP430 processor.	04
	(c) Explain the Process Management in RTOS along with describing the role of a Timer and Task Control Block.	07
OR		
Q.5	(a) Explain the multiplexing scheme in MSP430 processor for the port pins.	03
	(b) Explain the benefits of using DCO over Crystal in MSP430 based system.	04
	(c) Discuss in detail the Timer module of MSP430 with various modes of operation associated with it.	07
