Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VI (NEW) EXAMINATION – SUMMER 2022

Subject Code:3160311 Date:06/06/2022

Subject Name:Embedded System for Medical Device

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.**
4. **Simple and non-programmable scientific calculators are allowed.**

			MARKS
Q.1	**(a)**	What are the objectives of an OS?	**03**
	(b)	Define Embedded system. Explain the characteristics of Embedded System.	**04**
	(c)	Explain Classification and applications of embedded systems.	**07**
Q.2	**(a)**	What are the difference between Function, ISR and Task?	**03**
	(b)	Explain the difference between ARM and x86.	**04**
	(c)	Explain the Classification of Program Memory and Working Memory.	**07**
		OR	
	(c)	Draw the block diagram of any one Raspberry Pi board. And explain components of it.	**07**
Q.3	**(a)**	Explain the applications of Raspberry Pi Model.	**03**
	(b)	What is PCB of an OS?	**04**
	(c)	Enlist different Cooperative scheduling models of an OS. Briefly explain any two.	**07**
		OR	
Q.3	**(a)**	Define the terms: Real Time, RTOS and Preemptive Scheduling.	**03**
	(b)	Explain Interrupt Routines in an RTOS environment.	**04**
	(c)	Explain the architecture of ARM Cortex -A53.	**07**
Q.4	**(a)**	Explain different Arithmetic operations of image processing.	**03**
	(b)	Explain File read/write operation in python programming.	**04**
	(c)	Draw the circuit diagram to interface led and switch to Raspberry Pi. Write a program to read switch connected at Raspberry Pi board pin and turn on/off LED.	**07**
		OR	
Q.4	**(a)**	Explain different Data types in python programming.	**03**
	(b)	Explain Bitwise Logical Operation in image processing.	**04**
	(c)	Interface any one temperature sensor and ADC with RPi and display temperature in terminal.	**07**

Q.5	**(a)**	Explain Image read/write operation using python Programming.	**03**
	(b)	Write a short note on Audio playback on the Raspberry Pi.	**04**
	(c)	Explain interfacing of USB web camera with Raspberry Pi. Explain the steps to capture image and explain how to change the brightness of that image.	**07**

OR

Q.5	**(a)**	Explain basic Image operations in Raspberry Pi using OpenCV.	**03**
	(b)	Write a short note on Networking in Python.	**04**
	(c)	Explain interfacing of Pi camera with Raspberry Pi. Explain the steps to capture image, explain different image effect options and explain how to convert the captured image into negative image.	**07**

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