

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VI (NEW) EXAMINATION – SUMMER 2024****Subject Code: 3160311****Date:20-05-2024****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) Define Embedded system. Enlist essential parts of it.	03
	(b) Classify embedded systems with respect to application areas.	04
	(c) Discuss different memory types with suitable examples.	07
Q.2	(a) Briefly explain Task and Process.	03
	(b) Explain device management in OS.	04
	(c) Explain on board common communication interfaces of Embedded system.	07
	OR	
	(c) Discuss various interrupt handling routines in RTOS.	07
Q.3	(a) Enlist different layers of OS and explain any one.	03
	(b) Discuss memory management strategy of OS.	04
	(c) Explain tasking and scheduling mechanism of OS.	07
	OR	
Q.3	(a) Explain semaphores.	03
	(b) Discuss basic design using RTOS.	04
	(c) Explain ARM Cortex- A53 Architecture.	07
Q.4	(a) Give Comparison between ARM vs x86 processor.	03
	(b) Enlist features of Raspberry Pi module.	04
	(c) Explain various controlling statements in Python.	07
	OR	
Q.4	(a) Briefly discuss Exceptional handling in python.	03
	(b) Explain file operations in RPi. Write a python code to save system core temperature, date and time in text file.	04
	(c) Explain GPIO handling of RPi. Write a python code to Read switch (Pull down configuration) connected at board pin 8 and turn on/off LED (connected at board pin 10) accordingly	07
Q.5	(a) Provide basic commands to work with Rpi. (Directory operation, information of cpu and memory)	03
	(b) Write a python code to Perform addition and subtraction on medical image.	04
	(c) Write a python code to Interface LM35 temperature sensor with RPi using MCP3008 and display temperature in terminal.	07
	OR	
Q.5	(a) Provide basic image read and display operations using matplotlib.	03

- (b) Write a python code to Interface Picamera with Rpi and record video with 640*480 resolution **04**
- (c) Design an application with HC-SR04 to measure distance of obstacle and display it in Terminal. **07**
