

**GUJARAT TECHNOLOGICAL UNIVERSITY****BE - SEMESTER-VI (NEW) EXAMINATION – SUMMER 2023****Subject Code:3160311****Date:10-07-2023****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.

		<b>MARKS</b>
<b>Q.1</b>	(a) Define an embedded system. List out various applications of embedded systems.	<b>03</b>
	(b) What is Application Specific Integrated Circuit (ASIC)? Explain the role of ASIC in Embedded System design?	<b>04</b>
	(c) Write a short note on classifications of embedded systems.	<b>07</b>
<b>Q.2</b>	(a) What are the different types of memories used for Program storage in Embedded System Design.	<b>03</b>
	(b) What are the advantages of FLASH over other program storage memory in Embedded System design?	<b>04</b>
	(c) List out various on-board communication interfaces and explain any two in detail.	<b>07</b>
<b>OR</b>		
	(c) List out various external communication interfaces and explain any two in detail.	<b>07</b>
<b>Q.3</b>	(a) What are the specifications of the latest Raspberry Pi board?	<b>03</b>
	(b) What are the key differences between ARM and x86 architectures?	<b>04</b>
	(c) Write a brief note on ARM Cortex -A53 Architecture.	<b>07</b>
<b>OR</b>		
<b>Q.3</b>	(a) What are the supported operating systems for the Raspberry Pi?	<b>03</b>
	(b) List the layers between application and hardware.	<b>04</b>
	(c) Write a short note on Memory management functions in an OS kernel.	<b>07</b>
<b>Q.4</b>	(a) Definition of real time and RTOS. Enlist a basic function of OS.	<b>03</b>
	(b) Explain various data types in Python using example.	<b>04</b>
	(c) Write a short note on device management.	<b>07</b>
<b>OR</b>		
<b>Q.4</b>	(a) How can you capture an image using a Raspberry Pi camera module and save it to a file?	<b>03</b>
	(b) Explain image read/write operation with the help of example.	<b>04</b>
	(c) Briefly explain the controlling statements available in Python.	<b>07</b>
<b>Q.5</b>	(a) List the function of kernel.	<b>03</b>
	(b) Explain File read/write operation with a help of example.	<b>04</b>
	(c) Write a program in python to measure temperature and humidity using Raspberry Pi board. Draw a circuit diagram for the same.	<b>07</b>
<b>OR</b>		
<b>Q.5</b>	(a) How do you read, write, and display images using OpenCV?	<b>03</b>
	(b) Describe the use of matplotlib library to visualize images.	<b>04</b>
	(c) Explain a various operation on Images with the help of example.	<b>07</b>

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