O.P.Code: 23EC0451	R23	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR

(AUTONOMOUS)

B.Tech. III Year II Semester Regular Examinations April-2026

EMBEDDED SYSTEMS DESIGN

(Common to CSE, CCC & CSIT)

Time: 3 Hours **Max. Marks: 70**

PART-A

(Answer all the Questions **10 x 2 = 20** Marks)

1	a	List any two purposes of embedded systems.	CO1	L1	2M
	b	Define requirements analysis.	CO1	L1	2M
	c	What is a sensor? Give some example.	CO2	L1	2M
	d	Define a domain-specific processor.	CO2	L1	2M
	e	Why is ZigBee preferred in sensor networks?	CO3	L2	2M
	f	Write the applications of I2C.	CO3	L1	2M
	g	What is embedded firmware?	CO4	L1	2M
	h	State advantages of high-level language-based firmware development.	CO4	L1	2M
	i	Name any two types of operating systems used in embedded systems.	CO5	L1	2M
	j	Mention the difference between preemptive and non-preemptive scheduling.	CO5	L2	2M

PART-B

(Answer all Five Units **5 x 10 = 50** Marks)

UNIT-I

2	a	Briefly explain about the History of Embedded Systems.	CO1	L4	5M
	b	Describe the classification of Embedded systems based on Complexity.	CO1	L2	5M
		OR			
3		With a neat diagram, explain the design process of an embedded system.	CO1	L4	10M

UNIT-II

4	a	Describe the operation of Relay and Piezo buzzer.	CO2	L2	5M
	b	Discuss in detail about 7-segment LED display.	CO2	L2	5M
		OR			
5		Explain general-purpose processors and domain-specific processors used in embedded systems.	CO2	L4	10M

UNIT-III

6	a	Differentiate between I2C and SPI communication protocols.	CO3	L2	5M
	b	Explain in detail about the USB and its types of data transfer.	CO3	L4	5M
		OR			
7		Draw & explain the architecture of GPRS.	CO3	L4	10M

UNIT-IV

8	a	Write the advantages and limitations of the super loop approach.	CO4	L1	5M
	b	Compare super loop-based approach and OS-based approach.	CO4	L2	5M
		OR			
9		Explain debugging and testing techniques used in embedded firmware development.	CO4	L4	10M

UNIT-V

10	a	Describe the concept of priority-based task scheduling.	CO5	L2	5M
	b	Compare multiprocessing and multitasking.	CO5	L2	5M
		OR			
11		Explain task synchronization and the issues faced during task communication.	CO5	L4	10M

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