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P.E.S. College of Engineering, Mandya - 571 401

(An Autonomous Institution affiliated to VTU, Belagavi)

Sixth Semester B.E. - Electrical and Electronics Engineering

Semester End Examination; August - 2023

Embedded Systems

Time: 3 hrs *Max. Marks: 100*

Course Outcomes

The Students will be able to:

CO1: To study the applications and design challenges of Embedded System.

CO2: Analyze the selection of processor and applications of embedded system in various fields.

CO3: Obtain the knowledge of different types of memories and protocols used in Embedded System.

CO4: Analyze the design issues and different models used in Embedded System.

CO5: To get the basic knowledge of Real time operating systems and interrupts.

***Note**: I) **PART - A** is compulsory. **Two** marks for each question.*

*II) **PART - B**: Answer any **Two** sub questions (from a, b, c) for a Maximum of **18 marks** from each unit.*

Q. No.	Questions	Marks
	I : PART - A	**10**
1 a.	Classify the processors in embedded system.	2
b.	Differentiate between Timers and Counters.	2
c.	Define Interrupt Latency. How to avoid it?	2
d.	What are the challenges of embedded systems?	2
e.	Compare OS and RTOS.	2
	II : PART - B	**90**
	UNIT - I	**18**
2 a.	Differentiate Embedded system versus General computing systems.	9
b.	Explain embedded system classification based on generation.	9
c.	Explain the common design metrics in embedded systems.	9
	UNIT - II	**18**
3 a.	With neat schematic diagram, explain the architecture differences in general purpose, application specific and single purpose processor.	9
b.	Explain the following: i) Timer and counter ii) Watchdog timer iii) Real time clocks	9
c.	Explain the concepts of DAC with neat schematic	9
	UNIT - III	**18**
4 a.	Explain the RAM memory with neat schematic and differentiate between static and dynamic RAM	9
b.	With neat schematic, explain memory hierarchy and explain different cache mapping techniques	9
c.	Explain two protocol control methods: i) Strobe and ii) Handshake.	9

UNIT - IV **18**

5 a. What are the fundamental issues in software and hardware code sign? 9

b. Explain the following computational model:

i) Data flow diagram 9

ii) Control data flow diagram

c. What is UML diagram? Explain the things used in UML diagram. 9

UNIT - V **18**

6 a. Explain the round robin and round robin interrupts architecture with example code. 9

b. What is Scheduler? With neat schematic, explain different task states. 9

c. Explain in detail about semaphores and its operation. 9

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