U.S.N

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; July / Aug. - 2022
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: To understand the 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.

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

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

Q. No.	Questions	Marks	BLs	COs	POs
	I : PART - A	**10**			
I a.	Define an embedded system. Mention various purposes of embedded system.	2	L1	CO1	PO2
b.	Differentiate between microprocessors and microcontrollers.	2	L2	CO2	PO2
c.	What in a cache memory? Mention various cache memory mapping techniques.	2	L2	CO3	PO2
d.	What do you mean by hardware–software co-design? Mention fundamental issue to be considered for hardware software co-design.	2	L2	CO4	PO2
e.	What is task? List out various task states.	2	L1	CO5	PO2
	II : PART - B	**90**			
	UNIT - I	**18**			
1 a.	Classify and explain embedded system based on complexity and performance.	9	L1	CO1	PO2
b.	List and explain various design metrics of embedded system design.	9	L2	CO1	PO2
c.	What is an IC technology? Briefly describe various IC technologies.	9	L2	CO1	PO2
	UNIT - II	**18**			
2 a.	Explain various addressing modes of general purpose processor.	9	L2	CO2	PO2
b.	Explain the architecture of general purpose processor.	9	L2	CO2	PO2
c.	Write a note on following peripherals of the single purpose processor; i) UART ii) PWM	9	L2	CO2	PO2

UNIT - III   **18**

3 a. Explain internal structure of 4 x 4 capacity RAM with the aid of neat diagram.   9   L2 CO3 PO2

b. Describe simplified strobed and handshake protocols to transfer data between master and slave.   9   L2 CO3 PO2

c. Explain any three types of serial protocol.   9   L2 CO3 PO2

UNIT - IV   **18**

4 a. Describe state machine model used in embedded system design.   9   L2 CO4 PO2

b. What are the building blocks UML? Explain.   9   L1 CO4 PO2

c. Explain the important hardware software "tradeoffs" in hardware software partitioning.   9   L2 CO4   PO2

UNIT - V   **18**

5 a. Explain round robin architecture with an illustrative example.   9   L2 CO5 PO2

b. What is shared data problem? Explain how it can be solved using semaphores.   9   L2 CO5 PO2

c. Describe in brief message queues, mail box and pipes services of the RTOS.   9   L2 CO5 PO2

✳ ✳ ✳ ✳