



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

(An Autonomous Institution affiliated to VTU, Belagavi)

Seventh Semester, B.E. - Electronics and Communication Engineering

Semester End Examination; February - 2022

Embedded Systems

Time: 3 hrs

Max. Marks: 100

Course Outcomes

The Students will be able to:

CO1: Apply the knowledge of Microcontrollers to understand and explain the concepts of Embedded systems.

CO2: Analyze and understand the different issues involved in embedded system development using real time operating systems.

CO3: Discuss recent trends, EDLC and overview in the Design of Embedded systems.

CO4: Design and Develop a domain specific Embedded System Applications.

CO5: Design and Develop a domain specific Real Time Embedded System Applications.

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

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

Q. No.	Questions	Marks	BLs	COs	POs
I : PART - A		10			
I a.	What is an embedded system? Mention the typical elements of an embedded system.	2	L2	CO1	PO1
b.	Mention the importance of product life cycle graph.	2	L2	CO3	PO2
c.	Write a brief note on Java threads.	2	L1	CO5	PO3
d.	What is super loop based approach? Mention its limitations.	2	L2	CO2	PO2
e.	What are the objectives of EDLC?	2	L2	CO3	PO2
II : PART - B		90			
UNIT - I		18			
1 a.	With a neat block diagram, develop an embedded system for top load washing machine. Explain blocks in detail.	9	L4	CO5	PO3
b.	Explain the sequence of operation for communicating with an I2C slave device.	9	L2	CO3	PO1
c.	Discuss the wireless communication system used with embedded systems.	9	L4	CO1	PO2
UNIT - II		18			
2 a.	What is operational quality attribute? Explain the important operational quality attributes to be considered in any embedded system design.	9	L2	CO2	PO1
b.	With a neat flow diagram, explain the sequential program model for seat belt warning system.	9	L2	CO2	PO2
c.	Explain different communication busses used in automotive application.	9	L2	CO2	PO1
UNIT - III		18			
3 a.	List the types of multitasking existing in the operating systems context and discuss them briefly. Also mention how it differs from multi processing?	9	L2	CO2	PO2

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|---|---|----|-----|-----|
| b. Explain the round robin scheduling algorithm for a preemptive process with a suitable example. | 9 | L3 | CO2 | PO2 |
| c. What is deadlock? Explain about different conditions favoring deadlock. | 9 | L2 | CO2 | PO2 |

UNIT - IV**18**

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| 4 a. Explain the functional and non-functional requirements in the selection of RTOS for an embedded system. | 9 | L2 | CO3 | PO2 |
| b. Explain the architecture of the device drivers. | 9 | L2 | CO2 | PO2 |
| c. Explain the different “Embedded firmware design” approaches in detail. | 9 | L2 | CO2 | PO2 |

UNIT - V**18**

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|--|---|----|-----|-----|
| 5 a. Describe “Requirement Analysis phase” considering various activities in this phase. | 9 | L3 | CO2 | PO2 |
| b. Discuss any two models used in modeling EDLC. | 9 | L3 | CO4 | PO2 |
| c. List and discuss language trends in the design and development of an embedded system. | 9 | L3 | CO2 | PO2 |

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