

**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 System and IOT**

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: Analyse and understand the design challenges, methodology and Performance criteria of Embedded systems.**CO3: Understand and Analyse various sources of IoT& M2M communication protocols.**CO4: Analyse the data-acquiring and processing methods for IOT/M2M devices data and messages.**CO5: Analyse and understand the challenges and scheduling strategies for real time operating systems.***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.	Differentiate RISC and CISC processor.	2	L1	CO1	PO1
b.	List any four non-operational quality attribute.	2	L2	CO2	PO2
c.	Draw the architecture of operating system.	2	L1	CO5	PO3
d.	Mention any four software development tools in IOT.	2	L1	CO3	PO1
e.	Expand SOAP and REST.	2	L1	CO3	PO1
II : PART - B		90			
UNIT - I		18			
1 a.	Explain the purpose of embedded system.	9	L2	CO2	PO2
b.	List and explain any three external communication interfaces.	9	L1	CO1	PO1
c.	Discuss I2C bus with a suitable diagram.	9	L2	CO3	PO2
UNIT - II		18			
2 a.	Explain the characteristics of an embedded system.	9	L2	CO2	PO2
b.	Explain embedded system in automotive domain.	9	L2	CO2	PO2
c.	Discuss fundamental issues in hardware software co-design.	9	L2	CO2	PO2
UNIT - III		18			
3 a.	Three processes with process IDs, P ₁ , P ₂ , P ₃ with estimated completion time 10, 5, 7 ms and priorities 0, 3, 2 (0-highest, 3-lowest) respectively enters the ready queue together. Calculate the waiting time and turnaround time (TAT) for each process and the average waiting time and turnaround time. (Assume there is no I/O waiting for the processes) in priority based scheduling algorithm.	9	L3	CO5	PO3
b.	Explain Remote Procedure Call (RPC) and sockets.	9	L3	CO5	PO3
c.	Discuss dining philosopher's problem.	9	L3	CO5	PO3

UNIT - IV

18

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| 4 a. Explain the IOT reference model from CISCO that provides the framework for general IOT system. | 9 | L2 | CO4 | PO2 |
| b. Explain three domains of M2M architecture. | 9 | L2 | CO3 | PO2 |
| c. Discuss ITU-T reference model. | 9 | L2 | CO4 | PO2 |

UNIT - V

18

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| 5 a. Explain Message Queuing Telemetry Transport (MQTT) protocol. | 9 | L2 | CO4 | PO2 |
| b. Explain HTTP request and response method. | 9 | L2 | CO3 | PO2 |
| c. Explain briefly different ways of organizing data. | 9 | L2 | CO4 | PO2 |

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