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P.E.S. College of Engineering, Mandya - 571 401
(An Autonomous Institution affiliated to VTU, Belagavi)
Seventh Semester, B.E. - Electrical and Electronics Engineering
Semester End Examination; Dec - 2017 / Jan - 2018
Embedded Systems

Time: 3 hrs   *Max. Marks: 100*

*Note: Answer **FIVE** full questions, selecting **ONE** full question from each unit.*

UNIT - I

1 a.	What is an Embedded system? List and explain three main characteristics of Embedded systems that distinguish such systems from other computing systems.	8
b.	List and explain the three main processor technologies. What are the benefits of using each of the three different processor technologies?	6
c.	What is market window? Why is it so important for the products to reach market early in this window?	6
2 a.	What are the main approaches used in improving the design process for increased productivity? Explain them in detail.	10
b.	What are the common design metrics used in Embedded system design? Explain in detail.	10

UNIT - II

3 a.	What are the advantages of FLASH over other program storage memory in Embedded system design?	5
b.	List the sequence of operation for communicating with an I^{2}C slave device.	7
c.	Explain any two types of External communication interfaces used in Embedded design.	8
4 a.	Explain the role of Reset and Brown out protection circuit in Embedded system.	6
b.	What is a relay? What are the different types of relays available? With the help of circuit diagram explain the operation of a transistor based relay driver circuit.	6
c.	What is PPI Device? Explain the interfacing of 8255 PPI with an 8 bit microcontroller.	8

UNIT - III

5 a.	What is Hardware-Software co-design? Explain the fundamental issues in Hardware-Software co-design.	10
b.	With the help of a suitable example, explain how state machine model is used for modeling event driven system?	10
6 a.	What are the building blocks of VML? Explain in detail.	10
b.	Explain the important hardware-software tradeoffs in hardware-software co-design.	10

UNIT - IV

7 a. What are the different files generated during cross compilation of an Embedded *C* file? Explain them in detail. 10

 b. What are the advantages and limitations of simulator based debugging? Explain in detail. 10

8 a. What are the different techniques available for embedded firmware debugging? Explain any two in detail. 10

 b. Explain the different tools used for hardware debugging. 10

UNIT - V

9 a. With a suitable example, explain shared data problem. Also explain any one method of solving share data problem. 10

 b. With the help of an example, explain Round-Robin-With-Interrupts architecture. Give any two examples of systems for which Round-Robin-With-Interrupts architecture does not work well. Explain why it is so in those cases? 10

10 a. Compare the characteristics of following software architectures :
   i) Round Robin
   ii) Function Queue
   iii) RTOS
   6

 b. With the help of task state transition diagram, explain the various states in which a task can be and also explain the transition between various states. 6

 c. What are the different methods used for protecting shared data? Give a companion of these methods. 8

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