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

(An Autonomous Institution affiliated to VTU, Belgaum)

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

Semester End Examination; Dec - 2016/Jan - 2017

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? Classify and explain various types of embedded systems. 10
- b. Explain IC technology of an embedded system. 10
- 2 a. Explain the following design metric :
 - i) Time to Market Design Metric 10
 - ii) NRE and Unit cost Design Metric.
- b. With an example, explain purpose of embedded systems in Data Communication, Monitoring and Control applications. 10

UNIT - II

- 3 a. What is the difference between microprocessor and microcontroller? Explain the role of microprocessor and controllers in an embedded system design. 10
- b. Explain the various types of ROM used in embedded system design. 10
- 4 a. List the different on-board communication interface. Explain the sequence of operation for communicating with I2C slave device. 10
- b. Explain the role of reset circuit, real time clock and watchdog timer in an embedded system. 10

UNIT - III

- 5 a. What is hardware software co-design? Explain the fundamental issues in hardware software co-design. 10
- b. Explain the important hardware software tradeoffs in hardware software partitioning. 10
- 6 a. What is state and state machine? Explain the role of state machine in an embedded system design. 10
- b. Explain concurrent communicating process model. Write task and program model for seat belt warning system. 10

UNIT - IV

- 7 a. Explain the various HEX file in detail. 10
- b. What is role of simulator? Explain its advantages and disadvantages. 10

- 8 a. What are the different techniques available for embedded system firmware debugging?
Explain them. 10
- b. Explain the various hardware debugging tools used in embedded product development. 10

UNIT - V

- 9 a. What is shared data problem? Explain with an example. Show how problem can be solved? 10
- b. Explain Round Robin Architecture with an example. 10
- 10 a. Explain Semaphores concept. Discuss problem with Semaphores. 10
- b. Explain Round Robin with Interrupt Architecture with an example. 10

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