



--	--	--	--	--	--	--	--	--	--

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

(An Autonomous Institution affiliated to VTU, Belgaum)

First Semester, M. Tech. - VLSI Design and Embedded Systems (MECE)

Make-up Examination; Feb -2017

Advanced Embedded System

Time: 3 hrs

Max. Marks: 100

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

### UNIT - I

- 1 a. Define an embedded system. How are they classified? Discuss the characteristics of a processor to be used in the design of an embedded system. 10
- b. List the types of memory devices used in the design of any embedded system. Explain in brief the features of flash memory. 10
- 2 a. List the quality attributes of an embedded system? Explain any one attribute with an example. 10
- b. Explain the following types of communication interface with suitable example. 10
  - i) RS232C
  - ii) WiFi
  - iii) BLUETOOTH

### UNIT - II

- 3 a. Discuss with suitable examples the fundamental issues in hardware/software co – design. 10
- b. What are program models? Why they are used in embedded system design? State the advantages of program models. 10
- 4 a. Explain the role of firmware in the design of an embedded system. 10
- b. Write a note on the application of embedded firm ware development languages. 10

### UNIT - III

- 5 a. Define RTOS (Real time operating system). What are the functions of a RTOS? Explain any two functions with examples. 10
- b. Define the following with respect to the use of RTOS in an embedded system. 10
  - i) Process
  - ii) Threads
  - iii) Tasks
  - iv) Scheduling.
- 6 a. Define task communication. How tasks are executed based on the priority in an embedded system? 10
- b. What are device drives? How are they used in the design of an embedded system? 10

### UNIT - IV

- 7 a. Explain the role of an IDE for the embedded system development. 8
- b. What are the different files generated during the cross compilation of an embedded 'C' file? Explain in brief any two such files. 8
- c. Write a note on map file. How it is generated? 4

- 8 a. Differentiate a simulator and over emulator. 4
- b. What is boundary scan? How it is employed for system development? 8
- c. Explain the use of boundary scan in hardware debugging. 8

**UNIT - V**

- 9 a. Define EDLC. State how it is useful in the planning as development of an embedded system? 8
- b. State the difference phases of EDLC. Explain any two phases of EDLC with example. 8
- c. Write a brief with on modelling the EDLC. 4
- 10 a. Explain the role of processor development in Embedded system design. 8
- b. Explain with a suitable example the embedded OS trends. 8
- c. Explain why Linux is employed for an embedded system design. 4

\* \* \*