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**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

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|------|---|---|
| 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**

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|-------|---|---|
| 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 |

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