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**P.E.S. College of Engineering, Mandya - 571 401**  
*(An Autonomous Institution affiliated to VTU, Belgaum)*  
**Seventh Semester, B.E. - Computer Science and Engineering**  
**Semester End Examination; Dec. - 2014**  
**Embedded System**

*Time: 3 hrs*

*Max. Marks: 100*

*Note: Answer any FIVE full questions, selecting at least TWO full questions from each part.*

**PART - A**

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|----|--|----|
| 1. | a. Explain the differences between microprocessor and microcontroller.   | 6  |
|    | b. Explain any four addressing modes of 8051 microcontroller with example.   | 8  |
|    | c. Explain 8051 register bank.   | 6  |
| 2. | a. Explain DAC interface of 8051 and write a program to generate rectangular wave.   | 10 |
|    | b. Write an 8051 program to monitor P2.1 bit until it becomes high and transfer string "HELLO" at 4800 bps when P2.1 becomes high. (Write necessary comments). | 10 |
| 3. | a. Explain the Design metrics of Embedded systems.   | 12 |
|    | b. Briefly explain the process of converting an assembly language program into machine code and finally obtaining ROM image.                                   | 8  |
| 4. | a. Explain the classification of Embedded systems with example for each type.  | 6  |
|    | b. List the skills required for an Embedded system designers.  | 4  |
|    | c. Explain the diagram how LCD controller can be connected to the Embedded system using parallel port.   | 10 |

**PART - B**

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|----|---|----|
| 5. | a. Explain the following wireless protocols (i) Bluetooth (ii) ZIGBEE.  | 10 |
|    | b. Briefly explain the states of Timer.   | 5  |
|    | c. Explain watch dog Timer.   | 5  |
| 6. | a. Explain different sources of interrupt.  | 8  |
|    | b. With a diagram explain the control signals between processor, memory and DMA controller.                                     | 8  |
|    | c. Define interrupt latency. Briefly explain the estimation of maximum latency.   | 4  |
| 7. | a. Explain FSM model with example by showing state diagrams and state table for key '5' closure in T9 Keypad of a mobile phone. | 10 |
|    | b. What is PCB? Why it is needed explain its contents.  | 10 |
| 8. | a. Explain the handling of interrupt source calls in RTOS.  | 9  |
|    | b. Explain memory management functions of RTOS.   | 9  |
|    | c. List any two timer functions in an RTOS.   | 2  |