



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

(An Autonomous Institution affiliated to VTU, Belgaum)

Third Semester, M. Tech - Computer Engineering (MCEN)

Semester End Examination; Dec - 2016/Jan - 2017

Embedded Systems and Applications

Time: 3 hrs

Max. Marks: 100

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

UNIT - I

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| 1 a. | List and explain the characteristics of embedded computing applications. | 8 |
| | b. With an illustrative structure, discuss the applicability of each components of the requirement form. | 12 |
| 2 a. | With the help of a requirement form for the GPS moving map, draw an architecture and describe the same. | 12 |
| | b. Discuss the various challenges in embedded computing design. | 8 |

UNIT - II

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|------|--|----|
| 3 a. | With an illustrative sequence diagram, discuss the bus architecture and the working of DMA controller. | 10 |
| | b. Write Front panel design of ALARM clock. Also write the requirement table for ALARM clock. | 10 |
| 4 a. | Which are the three program components of embedded software? Discuss them in detail. | 10 |
| | b. Obtain CDFG and ARM assembly code for the given C code,
if (a+b>0)
x = 5;
else
x = 7; | 7 |
| | c. Obtain the single-assignment form of the given basic block,
w = a+b;
x = a-c;
w = x+d;
x = a+c; | 3 |

UNIT - III

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|------|---|----|
| 5 a. | Bring out the differences between thread and a process in RTOS. | 8 |
| | b. List and discuss the different types of multi tasking. | 6 |
| | c. With a neat diagram, discuss the concept of memory mapped object. | 6 |
| 6 a. | List and discuss in detail, the basic functions of a Real time Kernel. | 12 |
| | b. Discuss the various factors to be considered for the selection of scheduling algorithms. | 8 |

UNIT - IV

- 7 a. Discuss in detail, the types and functions of various target hardware debugging tools. 10
- b. With the help of the structure and the state transition graph. Discuss the working of I²C Bus system. 10
- 8 a. Discuss the working of Ethernet CSMA/CD algorithm in detail. 10
- b. With the help of an illustrative set up, discuss the working of monitor program based firmware debugging. 10

UNIT - V

- 9 a. List the various key Processor trends in embedded development. Discuss them in detail. 10
- b. Discuss the structure of the Java Development environment for embedded development. 10
- 10 a. Compare and discuss .NET CF with JAVA environment and list out the features. 10
- b. Write short notes on:
 - i) Open Mobile Alliance (OMA) 10
 - ii) Open Handset Alliance (OHA).

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