

Roll No .....

**MEVD - 205**

**M.E./M.Tech., II Semester**

Examination, June 2016

**Embedded Computing System Design**

*Time : Three Hours*

*Maximum Marks : 70*

**Note :** i) Attempt any five questions.  
ii) All questions carry equal marks.

1. a) What is an embedded computer systems? Write characteristics of Embedded Computing Applications. 7  
b) Provides an overview of the embedded system design process. What are the main objectives? 7
2. a) What is the difference between a big-endian and little-endian data representation? Give suitable examples for both. 7  
b) Answer the following questions about the ARM programming model : 7
  - i) How many general-purpose registers are there?
  - ii) What is the purpose of the CPSR?
  - iii) What is the purpose of the Z bit?
  - iv) Where is the program counter kept?
3. a) Why do most computer systems use memory-mapped I/O? What is the average memory access time of a machine whose hit rate is 93%, with a cache access time of 5ns and a main memory access time of 80ns? 7  
b) Provide a user-level example of 7
  - i) Static power management
  - ii) Dynamic power management

4. a) Name and explain the three structures or components that are commonly used in embedded software. 7  
b) With the help of a suitable diagram explain the role of assembler and linkers in the compilation process. 7
5. a) Explain the terms loop unrolling, Loop fusion, Loop distribution and Loop tiling. 7  
b) Explain the techniques for optimizing software performance. 7
6. a) Explain the term design flow. Draw and describe the waterfall model of software development. 7  
b) Briefly describe the distinction between requirements and specifications. 7
7. a) How to turn a specification into an architecture design. Explain how CRC card methodology is useful to help analyze a system's structure. 7  
b) Estimate the cost of finding and fixing a single software bug. 7
8. Write short notes on any two of the following : 14
  - a) Software modem
  - b) Embedded System for INTERNET applications
  - c) Loop optimization

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