

**GUJARAT TECHNOLOGICAL UNIVERSITY**  
**MCA - SEMESTER-V • EXAMINATION – SUMMER • 2015**

**Subject Code: 650012****Date: 11-05-2015****Subject Name: Software Development for Embedded Systems****Time: 02:30 pm to 05:00 pm****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1 (a)** Describe following terms: **07**
1. Technology
  2. Embedded System
  3. Renaissance Engineer
  4. General Purpose Processor
  5. Give Full Form: PSRAM, ISA
  6. HM6264 and 27C256
  7. Zero-bias Adjust
- (b)** Describe following Design Metrics: **07**
1. NRE Cost
  2. Time-to-market
  3. Time-to-prototype
  4. Correctness
  5. Maintainability
  6. Flexibility
  7. Safety
- Q.2 (a)** Explain Single-Purpose Processors and Application Specific Processors. **07**
- (b)** Write note on optimizing custom Single-Purpose Processors. **07**
- OR**
- (b)** Design a coffee machine controller, given that a coffee costs 75 cents and your machine accepts quarters only. Draw a black-box view, come up with a state diagram and state table, minimize the logic, and then draw the final circuit. **07**
- Q.3 (a)** Explain Datapath, Control Unit, and two memory architectures of General-Purpose Processor. **07**
- (b)** List Standard Single-Purpose Processors. Explain UART. **07**
- OR**
- Q.3 (a)** Describe direct, fully associative and set-associative Cache mapping techniques. **07**
- (b)** Draw internal view and external block diagram for 8 x 4 RAM and ROM. **07**
- Q.4 (a)** Explain following:
1. Port and Bus-Based I/O **04**
  2. Memory-Mapped I/O and Standard I/O **03**
- (b)** Write note of priority arbiter, daisy-chain arbitration and network-oriented arbitration methods. **07**
- OR**
- Q.4 (a)** Explain following:
1. I<sup>2</sup>C **03**
  2. PCI Bus **02**
  3. IrDA **02**
- (b)** Draw functional block-diagram specification of a digital camera and explain it. **07**  
 Also draw block-diagram of the executable model of the digital camera.

- Q.5 (a)** Explain PROM Programmers, ROM Emulators and Flash for getting Embedded Software into the Target System. **07**
- (b)** Define Simulators? Discuss various useful abilities for Simulators. **07**
- OR**
- Q.5 (a)** Define Cross-Compiler, Cross-Assembler. Explain Linker/Locators for Embedded Software. **07**
- (b)** Discuss OVERFLOW.C, LEVELS.C and DBGMAIN.C modules for Tank Monitoring System. **07**

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