

0802EC08ME02

II<sup>nd</sup> Semester M.Tech Examination, Dec-2009

Subject: Embedded Computing System Design

Subject Code: MEVD-205(A)

Time: Three Hours

Maximum Marks: 100

Min. pass marks: 40

Note: Attempt any FIVE questions. All questions carry equal marks. Assume the missing data, if any.

1. (a) Compare the top-down and bottom-up design. 10  
 (b) Define and explain the following with suitable example. 10  
 (i) UML (ii) Estop command (iii) Collaboration diagram  
 (iv) Set inertia command
2. (a) What does the SHARC CLIP instruction do? Write SHARC assembly code to first read and then write a device memory mapped to location 0,4000100. 10  
 (b) Write a program that uses a circular buffer to perform FIR filtering. 10
3. (a) Compare RISC and SISC. Explain the ARM processor. 10  
 (b) Write ARM assembly code to implement the following *if* statement. 10  

```

      if ( a > b ) {
          x = 5;
          y = c + d;
      }
      else x = c - d;
      
```
4. (a) What is *pipelining*? Explain the difference between *latency* and *throughput*. 10  
 (b) Discuss the CPU power consumption. Compare static v/s dynamic power management in CPUs. 10
5. (a) Explain data flow graph and CDFG (control/data flow graph). 10  
 (b) Draw the data flow graph and the extended data flow graph for the following basic block in C. 10  

```

      w = a + b;
      x = a - c;
      y = x + d;
      x = a + c;
      z = y + e;
      
```
6. (a) Explain the Assembly and linking. What are the assemblers? 10  
 (b) Show and explain the program generation technique from compilation through loading. 10
7. (a) Show how the execution time is optimized. 10  
 (b) Explain the elements of *program performance*. Show with suitable example the data dependant paths in *R* statement. 10
8. Write short notes on any TWO of the following: 20  
 a) Data Compressor  
 b) Software modem  
 c) CPU Bus protocol  
 d) Memory Organization