(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 2721 Roll No. 1 0 0 3 2 2 1 0 3

B.Tech.

(SEM. VII) ODD SEMESTER THEORY EXAMINATION 2013-14

EMBEDDED SYSTEM

Time : 3 Hours *Total Marks : 100*

Note :– (i) Answer **all** questions.

(ii) All questions carry equal marks.

1. Attempt any **four** parts of the following : **(5×4=20)**

   (a) Draw and explain the block diagram of a two level bus architecture in a microprocessor based embedded system.

   (b) How does concurrent processing help in VLIW instruction execution at high speed ?

   (c) Explain the need of watchdog timer.

   (d) What are the advantages offered by an ASIP for designing an embedded system ?

   (e) Explain use of each control bit of I^2C bus.

   (f) How does memory allocation differ in RTOS and OS ? What is memory locking ?

2. Attempt any **two** parts of the following : **(10×2=20)**

   (a) Discuss the advantages and disadvantages of using memory-mapped I/O versus standard I/O mapped.

(b) Define Harvard and Von Neumann architecture and what are the advantages of Harvard architecture ?

(c) How does a decoder help in memory and I/O devices interfacing ? Draw Four Exemplary circuit.

3. Attempt any **two** parts of the following : (10×2=20)

(a) Describe Pipelining, Superscalar and VLIW Architectures.

(b) What is interrupt vector ? Determine the contents of the Accumulator after the execution of the following program segments :

MOV A, #3CH

MOV R4, #66H

ANL A, R4

(c) Write ARM instruction for the following Z=(a«2)|(b&15)

4. Attempt any **two** parts of the following : (10×2=20)

(a) Discuss the advantages and disadvantages of using memory-mapped I/O versus standard I/O mapped. Explain the direct mapping techniques for cache.

(b) Write a short note on hierarchical RTOS. List three ways in which an RTOS handles the ISRs in a multitasking environment.

(c) Draw and explain serial transmission using UART's, a PC communicating serially with an embedded device.

5. Attempt any **two** parts of the following : (10×2=20)

(a) Describe Pipelining and Superscalar architectures. Write the differences between RISC and CISC.

(b) Draw system architecture of DMA using the ISA bus protocol and explain its memory write bus cycle.

(c) Write difference between 8051 Microcontroller and Microprocessor and write a program that will produce an output at port0 that counts down from 80H to 00H.