**Embedded System Test**

**General**

This test request from you, that you write some example C code, for a micro-

controller, you have programmed before (AVR, PIC, ARM, 8051, TMS470, etc, best

wold be Cortex-M3). It is not important, that you write every register correct, but we

would like to see, if you did that before, and know how to implement is.

Please write on your answer paper:

- Your Full name:

1. Please write an time interrupt

a) Define a time interrupt happen all 100ms

b) If the interrupt happens, switch Port 1.0 to ON(to high level)

2. What is the advantage of DMA?

3. Please write an example code to act on the level change of a processor pin.

a) When the level on Pin 1.1 change from LOW to HIGH, switch PORT 1.0 to HIGH

b) When the level on Pin 1.1 change from HIGH to LOW, switch PORT 1.0 to LOW

4.

a) Declare an array to contain 5 columns and 100 rows, to store floating point data.

b) Declare an pointer to that array

5.

a) Write a function, what get as parameter a pointer to the array above.

b) In the function, change the floating point value from the 2th row, 3th column, to

contain its original value plus 3.1428

6.

a) Define a struct containing the follwing information:

- LongInt NodeAddr

- Char [5] NodeName

- Int Value

- Pointer NextVal

b) Declare an instance variable of that struct

7. Declare an array of 200 values , each store a pointer to a struct, declared in Question 6.

Allocate enough memory, to store 200

8. How many bytes does the following C datatype consume on a typical 32 Bit

Micro-controller?

a)Byte

b) Char

c) Integer

d) Float

e) string

f) pointer

9. Use the Struct from Question 6, to build a tree.

a) Declare the root node, set the field NodeName =’root’; Value =random(10)

b) Add a sub-node, where NextVal in the root node containing the pointer to the sub-

node, set the field NodeName =’node1’; value2=random(10)

c) Add a sub-node, where NextVal in the sub-node of b) contains the pointer to this

sub-node. Set the field NodeName=’node2’; value2=random(10)

10. Write a function, what takes a pointer to the tree in Question (9),

Iterates over the tree nodes, and find the first node, having value2 >= 3

11. Arthmetic operations: for a 32-Bit register, called ADC\_CONF\_REG

a) Clear bit 7 in ADC\_CONF\_REG

b) Set the bits(8..15) of ADC\_CONF\_REG to ‘01010101’ in an effective way

c) Set the upper 16 Bits of ADC\_CONF\_REF, if they are set in an other, 16 Bit(1)

register ADC\_CAL\_REF.