EMBEDDED SYSTEMS 2016/2017/2018: THEORY [6/9 credits course]

8 T/F questions: 0.5 points for right answers, -0.25 points for wrong ones, and 0 for no answer

3 open questions: up to 2 points for right and complete answers

Max total: 10 points

Available time: 60 minutes

Name:_____

TRUE or FALSE?

1) *Embedded Systems* are often used to introduce innovation in traditional products.

2) To exploit a *General Purpose Processor*, it is needed a compiler for a specific *Instruction Set Architecture*.

3) If the *Time-To-Market* of a product is 6 months, the time available to reach the market in the best moment is 6 months.

4) The *Instruction Set Architecture* of an *Applications Specific Instructions Processor* is never customizable.

5) The Intel 8051 model used in the homelab has only 2 input/output ports.

6) EPROM are non-volatile memories.

7) It is possible to use floating-point arithmetic also on processors without a FPU.

8) Given the following *nesC* code related to an event management …

```
event void myTimer.fired()
{
        counter++;
        call Leds.Led0Toggle();

        if (!busy)
        {
                BlinkToRadioMsg* btrpkt = (BlinkToRadioMsg*)(call Packet.getPayload(&pkt, NULL));
                btrpkt->nodeid = TOS_NODE_ID;
                btrpkt->counter = counter;
                if (call AMSend.send(AM_BROADCAST_ADDR, &pkt, sizeof(BlinkToRadioMsg)) == SUCCESS)
                {
                        busy = TRUE;
                }
        }
  }
```

it calls 4 different *commands*.

OPEN QUESTIONS

1) Describe the main features of *fixed* and *vectored* interrupt management techniques and highlight their differences.

2) Describe the main features of a *re-entrant function* and discuss at least one situation in which it is useful.

3) Describe the main features of a *typical HW/SW timer implementation.*