

# Tutorial 6

## Question 1: (6)

Assuming that the RCC is configured with default values.

- a) Assuming the prescaler contains the value 100, how much time will it take for the CNT register to go from 0 to 0xFF (2)
- b) What is the minimum frequency of timer overflows? (1)
- c) Assume the ARR register contains the value 1024 and the PSC register contains the value 780, at what frequency would overflow occur? (1)
- d) Assume the ARR register contains the value 5119, what is the closest integer value of the PSC register which would result in an overflow frequency of 2 Hz? (1)
- e) Does a timer overflow always cause the timer to request an interrupt? Explain. (the answer to this question has nothing to do with the NVIC) (1)

## Question 2: (6)

- a) What are the two main purposes of the NVIC? (2)

See section 4.2 of the Programming Manual and Table 33 of the Reference Manual.

- b) Which bit in which register needs to be set in order to cause the NVIC to allow the USART2 global interrupt to be passed to the CPU. (1)
- c) Assuming you wanted an instruction which has been labeled "IRQ\_Handler" to be executed whenever the SPI1 module generates an interrupt. At which memory address should you place the address of the instruction labeled "IRQ\_Handler"? (1)
- d) How does the process of returning from an interrupt work? Make reference the stack frame in your answer. (2)

## Question 3: (3)

Provide a brief description of what a makefile is any why it is useful. (3)

Marks: 15