1. What are the GPIO control registers that the lab mentions? Briefly describe each of their functions.

MODER – Sets the mode of the pin to input, general purpose output, alternate function, analog

OTYPER – Selects type of output from push-pull or open drain

OSPEEDR – Selects speed of output from low, medium, high

PUPDR – Sets pull up and/or pull down

IDR – Input data register, read only, contains state of input port

ODR – Outpud data register, read write, can read or set state of output port

BSRR – Bit set/reset register, BR resets output port when set high, BS sets output port when set high

LCKR – Locks configuration of port bits

AFRL/AFRH – Configures ports alternate function

BRR – Setting high will reset output port state

1. What values would you want to write to the bits controlling a pin in the GPIOx\_MODER register in order to set it to analog mode?

11

1. Examine the bit descriptions in GPIOx\_BSRR register: which bit would you want to set to clear the fourth bit in the ODR?

BR[4] – GPIOx\_BSRR[20]

1. Perform the following bitwise operations:
   1. 0xAD | 0xC7 = 10101101 AD

11000111 C7

11101111 =EF

* 1. 0xAD & 0xC7 = 10101101 AD

11000111 C7

10000101 = 85

* 1. 0xAD & ~(0xC7) = 10101101 AD

00111000 ~C7

00101000 = 28

* 1. 0xAD ^ 0xC7 = 10101101 AD

11000111 C7

01101010 = 6A

1. How would you clear the 5th and 6th bits in a register while leaving the others alone?

REG &= ~((1 << 5)) | (1 << 6))

1. What is the maximum speed the STM32R072R8 GPIO pins can handle in the lowest speed setting?

2 MHz

1. What RCC register would you manipulate to enable the following peripherals:
   1. TIM1 – RCC\_APB2ENR[11]
   2. DMA1 – RCC\_AHBENR[0]
   3. I2C1 – RCC\_APB1ENR[21]