

1. **List two things you can learn from a peripheral's functional description in the peripheral reference manual?**
  - a. Serial communication between the MCU and external devices.
  - b. The functions of Configuration registers as their corresponding bits and how they affect peripheral operation.

2. **What is the title of the first sub-section in the functional description of timers 2 and 3?**

- **Not mentioned in the lab manual; look it up!**

The title of the first subsection in the functional description of timers 2 and 3 is the *Time-base unit*.

3. **What is the purpose of the Prescaler (PSC) register?**

The purpose of the Prescaler (PSC) register divides the input clock timer. The prescaler can divide the counter clock frequency by any factor as long as it is between 1 and 65536. It's based on a 16-bit counter controlled with a 16-bit/32-bit register.

4. **What is the purpose of the Auto-Reload (ARR) register?**

The purpose of the Auto-Reload (ARR) register is to be a trigger point where the timer resets and then begins to count a new period.

5. **What is the purpose of the Capture/Compare (CCR<sub>x</sub>) register while the timer is operating in Output Compare mode?**

The purpose of the Capture/Compare (CCR<sub>x</sub>) register is to produce a desired output while the timer is running, then using compare mode it will modify the output of a GPIO pin based on the value in the CCR<sub>x</sub> register. It can control timing related operations such as generating output signals, event triggering, pulse generation, and PWM implementation.

6. **What does the duty-cycle of a PWM signal represent?**

The duty-cycle of a PWM signal is to be the signal where every period is a ratio of on and off time. This is known as the and represents a analog voltage ranging between a low and high voltage of the digital signal.

7. **What is the purpose of the Alternate Function mode for a GPIO pin?**

The purpose of the Alternate Function mode for a GPIO pin is to give different options when selecting pins for a peripheral. Due to the large number of possibilities many pins have alternate functions that connect across different peripherals.

8. **In what document can you find the documentation for what GPIO pins have which alternate functions?**

It can be found in the Peripheral Reference Manual where detailed tables and diagrams that specify alternate functions available for each GPIO pin. It also contains corresponding pin numbers and functions .