**MST VIVIA Questions**

**Atmega 328p microcontroller with 32KB flash memory and it is DIP dual pagage pins on both side**

**Total Pins – 28**

**Digital Pins – 14**

**PWN Pins – 6 Pins 3,5,6,9,10,11**

**Analog Pins – 6 A0 – A5**

**GND PINS -3**

**pinMode ( )**

The specific pin number is set as the INPUT or OUTPUT in the pinMode () function.

The Syntax is: **pinMode (pin, mode)**

Where,

**pin:** It is the pin number. We can select the pin number according to the requirements.

**Mode:** We can set the mode as INPUT or OUTPUT according to the corresponding pin number.

The delay () function is a blocking function to pause a program from doing a task during the specified duration in milliseconds.

The **analogRead( )** function reads the value from the specified analog pin present on the particular Arduino board.

The main differences between analogRead() and analogWrite() are listed below:

* The analogRead() is used to read the analog value, while analogWrite() function is used to write the PWM value.
* The value of analogRead() ranges from 0 to 1023, while analogWrite() ranges from 0 to 255

The ADC (Analog to Digital Converter) on the [Arduino](https://www.javatpoint.com/arduino) board is a multichannel converter. It maps the input voltage and the operating voltage between the values 0 and 1023. The operating voltage can be **5V or 3.3V.**

The PWM (**Pulse Width Modulation**) is a method of controlling the average voltage. It is a **stream of voltage pulses** that reduces the electric power supplied by the electrical signal. The effective voltage is controlled by the width of individual pulses in a stream of voltage pulses of a PWM signal.

**The potentiometer** is a device that is used to measure the voltage or electric potential. It provides a variable resistance when the shaft of the device is turned.

**The Resistor** is device that is used to resistor is to restrict the amount of current that flows through the resistor into the LED,

**Pull-up resistors** are fixed value resistors used between the connection of a voltage supply and a particular pin in a digital logic circuit. More commonly paired with switches, its purpose is to ensure the voltage between Ground and Vcc is actively controlled when the switch is open

Similarly to **pull-up resistors**, pull-down resistors ensure the voltage between VCC and a microcontroller pin is actively controlled when the switch is open. However, instead of pulling a pin to a high value, such resistors pull the pin to a low valued instead.

**Crystal Ocillator** is used with arduino uno and its frequency is 16 Mega Hertz it is used to geneate wave form The waveform is also called is clock.

Led Brigthness – Ardunio uno provides PWN that can periodically OUTPUT high andLOW.The PWN function periodically switching between high and low at a specified rate that can be used to adjust the led brightness.

The Ultrasonic sensor or HC-SRO4 is used to measure the distance of the object using SONAR. t emits the Ultrasound at a frequency of **44KHZ** The frequency travels through the air and strikes the object on its path. The rays bounce back from the object and reach back to the module. The Ultrasonic sensors work best for medium ranges. The UltraSonic Sensor (HC-SR04): Digital Sensor

**ECHO PIN**The ultrasound transmitter (trig pin) emits a high-frequency sound (40 kHz). The sound travels through the air. If it finds an object, it bounces back to the module. The ultrasound receiver (echo pin) **receives the reflected sound** (echo)

The resolution is **0.3cm**.

The medium ranges of the sensor are **10cm** to **3m**. It works best at this duration.

The maximum range the sensor may detect is **4.5m**.

PUSH BUTTON The buttons are similar to switches that create and break electrical connections in the circuits. The button plays a transition between ON and OFF state. A single press turns the state ON, while another press turns the state OFF. It means that the button connects the two points in a circuit when we press them. Application of push button

1. User input: Push buttons can be used to provide user input for controlling various functions of the Arduino project, such as starting/stopping a process, changing modes or settings, etc.
2. Power on/off: Push buttons can be used to turn on/off power to the Arduino board or other components in the project.
3. **lcd.display()** is a function that turns the display on or off. When the display is turned on, it will show the text, numbers, or symbols that are currently stored in the buffer. When the display is turned off, the buffer is not cleared, and the data is still there. This means that when the display is turned back on, the same text, numbers, or symbols will be displayed again.
4. **lcd.blink()** is a function that causes the cursor to blink. The cursor is the symbol that indicates where the next character will be displayed on the screen. By default, the cursor is a blinking vertical line. When **lcd.blink()** is called, the cursor will start blinking. This can be useful for drawing attention to a particular part of the display, or for indicating that the user should enter something at that location.

**a common cathode** is a type of LED (Light Emitting Diode) where all the cathodes of the LEDs are connected together and the anodes of each LED are separate. In this configuration, the voltage is applied to the anodes to turn on each individual LED.

On the other hand, a common anode is a type of LED where all the anodes of the LEDs are connected together and the cathodes of each LED are separate. In this configuration, the voltage is applied to the cathodes to turn on each individual LED.

Display Type:

LCD is a type of display that uses liquid crystals to create characters or images on a screen.

Seven Segment Display is a type of electronic display that consists of seven LEDs arranged in a specific pattern to display numeric characters (0-9).

Information Displayed:

LCD can display text, numbers, and even graphical images.

Seven Segment Display can only display numeric digits.

Display Method:

LCD displays information using pixels, which can be individually controlled to form characters or images.

Seven Segment Display uses LEDs to form the digits, which can be turned on or off to form the required numbers.

Complexity:

LCD is more complex to use than Seven Segment Display because it requires more programming and wiring to set up.

Seven Segment Display is relatively simple to use as it requires fewer pins and is easier to program.

Flexibility:

LCD is more flexible than Seven Segment Display as it can display more types of information and can be used for various purposes.

Seven Segment Display is limited to displaying only numeric digits.