Quiz Solutions

1. Bend the leads of components at **45** degree angle with PCB.

   (a) 40

   (b) 50

   (c) 35

   (d) **45**

   Explanation: Components leads are typically bent at 45° for proper PCB insertion and soldering.

2. What measurements can you make using a oscilloscope?

   (a) Current, Voltage and resistance

   (b) **Voltage, period and frequency**

   (c) Time, frequency and resistance

   (d) Power, distance and frequency

   Explanation: Oscilloscopes primarily measure voltage over time, from which period and frequency can be derived.

3. What will be the power dissipation across a silicon diode carrying a current of 50 mA.

   (a) 25 mW

   (b) 50 mW

   (c) **35 mW**

   (d) 100 mW

   Explanation: Power = Voltage × Current = 0.7V × 50mA = 35mW (using typical 0.7V drop for silicon diodes).

4. Which among the below mentioned approaches belongs to the category of In-circuit Testing?

   (a) Impedance Testing

   (b) Component Testing

   (c) Apply Signal and check output

   (d) **All of the above**

   Explanation: In-circuit testing can include impedance checks, component verification, and signal testing.

5. What language is a typical Arduino code based on?

   (a) Assembly Code

   (b) Python

   (c) Java

   (d) **C/C++**

Explanation: Arduino programming language is based on C/C++ with simplified libraries.

6. Arduino Codes are referred to as **sketches** in the Arduino IDE.

   (a) **sketches**

   (b) drawings

   (c) links

   (d) notes

   Explanation: The Arduino IDE uses the term "sketches" for program files by convention.

7. What is the use of the Vin pin present on some Arduino Boards?

   (a) To ground the Arduino Board

   (b) **To power the Arduino Board**

   (c) To provide a 5V output

   (d) Is used for plugging in 3V supply

   Explanation: Vin is used to power the board with an external voltage (7-12V recommended).

8. What will be the output of the following Arduino code?

```
#define X 10;
void setup(){
 X=0;
 Serial.begin(9600);
 Serial.print(X);
}
void loop(){
 //Do nothing...
}
```

   (a) 0xAB

   (b) 0xa

   (c) 0

   (d) **Error**

   Explanation: The code will produce a compilation error because you cannot assign a value to a macro (X is defined as constant 10).

9. What describes the circuit connections in the diagram of PCB design?

   (a) Schematic Capture

   (b) PCB Layout

   (c) Equipment's

(d) **a & b**

Explanation: Both schematic capture (logical connections) and PCB layout (physical implementation) describe circuit connections.

10. What is the output of "pin1" if "pin2" is sent "1011" where 1 is 5V and 0 is 0V?

```
int pin1 = 12;
int pin2 = 11;
void setup(){
 pinMode(pin1, OUTPUT);
 pinMode(pin2, INPUT);
}
void loop() {
 if(digitalRead(pin2)==1) {
  digitalWrite(pin1,LOW);
 }
 else if(digitalRead(pin2)==0) {
  digitalWrite(pin1,HIGH);
 }
}
```

(a) 1110

(b) **0100**

(c) 1111

(d) 1011

Explanation: The code implements an inverter - pin1 outputs the opposite of pin2's input (1011 becomes 0100).

11. What is the output of the program given below if a voltage of 5V is supplied to the pin corresponding to the A0 pin on an Arduino UNO?

```
void setup(){
 Serial.begin(9600);
 pinMode(A0, INPUT);
}
void loop(){
 int s = analogRead(A0);
 Serial.println(s);
}
```

(a) 0

(b) **1023**

(c) null

(d) Error

Explanation: The 10-bit ADC will return 1023 (maximum value) for 5V input (Arduino's reference voltage).

12. What type of signal does the analogWrite() function output?

   (a) Pulse Code Modulated Signal

   (b) Frequency Modulated Signal

   (c) **Pulse Width Modulated Signal**

   (d) Pulse Amplitude Modulated Signal

Explanation: analogWrite() generates PWM (Pulse Width Modulation) signals on supported pins.

13. A **LED** Arduino UNO is connected to pin 13 on an Analog-to-Digital Convertor (ADC)

   (a) Buffer

   (b) **LED**

   (c) Digital-to-Analog Convertor (DAC)

Explanation: Pin 13 has a built-in LED on most Arduino boards (though it's a digital pin, not ADC input).

14. While you upload a sketch to the Arduino UNO, the Tx and RX LEDs should...

   (a) Be constantly ON

   (b) **Blink Rapidly**

   (c) Be OFF

Explanation: These LEDs blink during serial communication (uploading is serial communication with the bootloader).

15. Traces and planes utilized in PCB designing comprises of **Copper**?

   (a) Lead

   (b) **Copper**

   (c) Silver

   (d) Titanium

Explanation: PCBs use copper for conductive layers due to its excellent conductivity and cost-effectiveness.

16. How many conducting layers are present in Single-sided PCB?

   (a) **One**

   (b) Two

   (c) Three

   (d) Four

Explanation: Single-sided PCBs have conductive traces on only one side of the substrate.

17. Conducting layer added on bottom and top of **Double-sided** PCBs.

    (a) Single-sided

    (b) **Double-sided**

    (c) Multilayer

    (d) Rigid

    Explanation: Double-sided PCBs have copper layers on both sides of the substrate.

18. What is calculated based on various circuit's current necessities?

    (a) Impedances

    (b) Number of Layers

    (c) **Trace Width**

    (d) Plane Width

    Explanation: Trace width is determined by current requirements to prevent overheating and ensure proper current capacity.

19. Color code for 1 ohm resistance is -

    (a) Black, Brown, Gold

    (b) **Brown, Black, Gold**

    (c) Both of them

    (d) None of them

    Explanation: 1 ohm resistor is coded as Brown (1), Black (0), Gold (×0.1 multiplier).

20. What connects pins of components in PCB?

    (a) Traces

    (b) Planes

    (c) **Nets**

    (d) Points

    Explanation: Nets represent electrical connections between component pins in PCB design.