IoT Practical Exam Codes on Arduino IDE

1. LED Blink (Basic)

This is the most fundamental code, where an LED connected to pin 13 blinks every second.

```
void setup() {
  pinMode(13, OUTPUT); // Set pin 13 as output
}

void loop() {
  digitalWrite(13, HIGH); // Turn LED on
  delay(1000);          // Wait for 1 second
  digitalWrite(13, LOW);  // Turn LED off
  delay(1000);          // Wait for 1 second
}
```

2. Button Controlled LED

A button is connected to pin 2, and an LED is connected to pin 13. The LED turns on when the button is pressed.

```
int buttonState = 0; // Variable to store the button state

void setup() {
  pinMode(13, OUTPUT);  // Set pin 13 as output for LED
  pinMode(2, INPUT);    // Set pin 2 as input for button
}

void loop() {
  buttonState = digitalRead(2); // Read the state of the button

  if (buttonState == HIGH) {
```

```
    digitalWrite(13, HIGH); // Turn LED on
  } else {
    digitalWrite(13, LOW);  // Turn LED off
  }
}
```

3. Temperature Sensor (LM35)

This code reads temperature from an LM35 sensor connected to A0 and prints it to the Serial Monitor.

```
int tempPin = A0; // Pin where the sensor is connected

void setup() {
  Serial.begin(9600); // Start the serial communication
}

void loop() {
  int reading = analogRead(tempPin); // Read the analog value
  float voltage = reading * (5.0 / 1023.0); // Convert to voltage
  float temperature = voltage * 100; // Convert to temperature (°C)
  Serial.print("Temperature: ");
  Serial.print(temperature);
  Serial.println(" °C");
  delay(1000); // Wait 1 second before next reading
}
```

4. Ultrasonic Sensor (HC-SR04)

This code reads the distance measured by an ultrasonic sensor and prints it to the Serial Monitor.

```
#define echoPin 7 // Echo pin
```

```
#define trigPin 8 // Trigger pin

void setup() {
  pinMode(trigPin, OUTPUT);
  pinMode(echoPin, INPUT);
  Serial.begin(9600); // Start serial communication
}

void loop() {
  digitalWrite(trigPin, LOW);
  delayMicroseconds(2);
  digitalWrite(trigPin, HIGH);
  delayMicroseconds(10);
  digitalWrite(trigPin, LOW);

  long duration = pulseIn(echoPin, HIGH);
  float distance = duration * 0.034 / 2; // Convert time to distance
  Serial.print("Distance: ");
  Serial.print(distance);
  Serial.println(" cm");
  delay(500);
}
```

5. Turn LED ON

This code turns an LED connected to pin 13 ON permanently.

```
void setup() {
  pinMode(13, OUTPUT);  // Set pin 13 as output
  digitalWrite(13, HIGH); // Turn LED on
}

void loop() {
  // Nothing to do here
}
```

6. Turn LED OFF

This code turns an LED connected to pin 13 OFF permanently.

```
void setup() {
  pinMode(13, OUTPUT);  // Set pin 13 as output
  digitalWrite(13, LOW); // Turn LED off
}

void loop() {
  // Nothing to do here
}
```

7. Fade LED

A simple code to gradually fade an LED connected to pin 9 using PWM.

```
void setup() {
  pinMode(9, OUTPUT);  // Set pin 9 as output
}

void loop() {
  for (int i = 0; i <= 255; i++) {
    analogWrite(9, i);  // Increase brightness
    delay(10);
  }
  for (int i = 255; i >= 0; i--) {
    analogWrite(9, i);  // Decrease brightness
    delay(10);
  }
}
```

8. Button Press Counter

This code counts how many times a button connected to pin 2 is pressed.

```
int buttonPin = 2;
int count = 0;

void setup() {
  pinMode(buttonPin, INPUT);
  Serial.begin(9600);
}

void loop() {
  if (digitalRead(buttonPin) == HIGH) {
    count++;
    Serial.println(count); // Print count to serial monitor
    delay(500); // Debounce delay
  }
}
```

9. Serial Print "Hello"

A simple code that prints "Hello" to the Serial Monitor every second.

```
void setup() {
  Serial.begin(9600); // Start serial communication
}

void loop() {
  Serial.println("Hello");
  delay(1000); // Print every 1 second
}
```

10. Button-Activated Buzzer

This code activates the buzzer when a button is pressed.

```
int buttonPin = 2;
int buzzerPin = 8;
```

```
void setup() {
  pinMode(buttonPin, INPUT);
  pinMode(buzzerPin, OUTPUT);
}

void loop() {
  if (digitalRead(buttonPin) == HIGH) {
    digitalWrite(buzzerPin, HIGH);  // Turn buzzer on when button pressed
  } else {
    digitalWrite(buzzerPin, LOW);   // Turn buzzer off
  }
}
```

11. Turn ON Multiple LEDs

This code turns on two LEDs connected to pin 12 and pin 13.

```
void setup() {

  pinMode(12, OUTPUT);  // Set pin 12 as output

  pinMode(13, OUTPUT);  // Set pin 13 as output

  digitalWrite(12, HIGH); // Turn LED on pin 12 on

  digitalWrite(13, HIGH); // Turn LED on pin 13 on

}


void loop() {

  // Nothing to do here

}
```

12. Serial Print Numbers

A simple code that prints numbers to the Serial Monitor every second.

```
int count = 0;

void setup() {
  Serial.begin(9600); // Start serial communication
}

void loop() {
  Serial.println(count); // Print the value of count
  count++;
  delay(1000); // Wait 1 second
}
```