Session 01: Changing the clock rate of ESP 32 Microcontroller

Date of the Session: 27 / 12 / 24 **Time of the Session:**_____**to**____

PREREQUISITE:

- General idea of clock frequency, ESP32 board
- General idea of basic circuit

PRE-LAB:

1) What is the role of the CPU clock speed in a microcontroller like the ESP32?

   Determines the execution speed of instructions affecting the performance.

2) What is the default CPU clock speed of the ESP32, and how can it be configured?

   240MHz, configurable to lower frequency via software setting.

OBJECTIVE:

To design and implement a serial communication port, check the CPU clock rate & XTAL Freq & APB bus clock.

COMPONENTS REQUIRED:

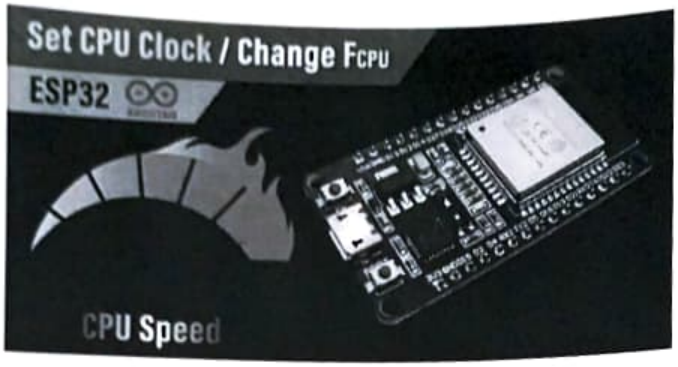
- ESP32
- Breadboard
- Connecting wires
- Micro USB cable

THEORY:

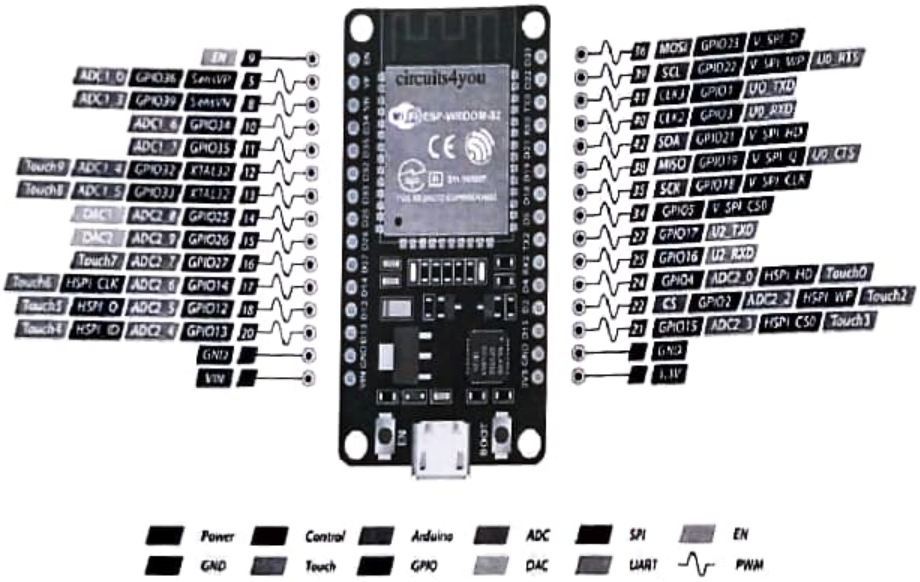
ESP32 CPU Speed (Frequency):

The ESP32 is a dual-core system with two Harvard Architecture Xtensa LX6 CPUs. All embedded memory, external memory, and peripherals are located on the data bus and/or the instruction bus of these CPUs.

CIRCUIT:



ESP32:



CODE:

```
#define GPIO_PIN5
uint32_t freq=0;
void setup()
{
    pinMode(GPIO_PIN, OUTPUT);
    Serial.begin(115200);
    Serial.println("Default CPU freq");
    Serial.println(getCpuFrequencyMhz());
}

void loop()
{
    digitalWrite(GPIO_PIN,1);
    digitalWrite(GPIO_PIN,0);
}
```

POST LAB:

Take the snapshot of Tinker CAD simulation and paste here with your REG NO on it.

INTERFERENCE & ANALYSIS

The clock speed was shown

RESULT

The experiment was executed successfully