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# IOT ASSIGNMENT

Question 1 What do you mean by Smart Cities explain using IoT?

Smart City offers all types of uses Cases which includes traffic management to water distribution, waste management, etc.

Some Component of Smart City and their Impact in the IOTERA

### 1 Smart Infrastructure

Cities must Create the Condition for Continuous development digital technology are becoming increasing important, urban infrastructure and building must be planned more efficiently, and Suitably

### 2 The City Air Management Tool:

~~Cities must Create the Condition~~

Siemens has developed a Complete, cloud-based Software-Suite "the City Air Management Tool" Captures Pollution data In real time and forecasts emissions

### 3 Traffic Management

Integrated Sensors send real-time update of traffic flow to a Central traffic management platform which analyses the data and automatically adjust traffic light to the traffic situation within seconds.

### 4 Smart Parking

Smart parking is reality today and does not required Complicated and high Investment making them ideal for a mid Size Smart City.

## Question 2 How is a breadboard Connected?

- where you Connect your electronic Component on your breadboard is Important, because that Control what other Component they are able to Connect to
- Each horizontal row on terminal strip is Connected - meaning that anything you Plug in on that will be electrically Connected to anything else Plugged in on that row
- Any electronic Project you do with a breadboard will have its own requirement So you'll need to check your Project breadboard diagram and Instruction to identify where to Connect the Component
- The hole in a breadboard are Connected by Metal chips that ~~span~~ five holes to be Connected
- there are no Vertical Connection a terminal strip Horizontal row on either Side of the Centre groove are also not Connected to each other.

Question 3 what is tri color LED?

Tri Colour LED is a Combination of three LED In just one Package : a red, a green, & a blue Led. The Colour Produce by the RGB LED is a Combination of the LED Colour

There are Common anode and Common Cathod RGB LED.

Tri Colour LED also known as RGB LED. In Tri Colour LED there are four LEAD arrangement with one Common lead and additional lead for each Colour. By Combining these three Colour of RGB LED we can Produce many different Colours as well this can be actived by Configuring the Intensity of Each Led.

Question 4 Is Resister is Passive or active device

→ Components Incapable of Controlling Current by means of another electrical Signal are Called Passive device So Resister is Passive device

Question 5 Define IoT Network

An IoT network refers to a Collection of InterConnected device that Communicate with other devices without the need for human involvement such a autonomous Cars, Smart appliances and wearable tech.

## IOT Network 5G

IOT is a Control use Case of 5G Infrastructure, this is because the Current mobile network are already struggling to keep up with the resource demand of the exploding IOT device market

## Question 6 what is M2M Communication ?

- • M2M is about direct Communication between Machine
- It Support point to point Communication
- Device do not necessarily rely on Internet Connection
- M2M is mostly hardware-based technology
- Machines normally Communicate with a Single machine at a time
- A devices Can be Connected through mobile or other network

## Question 7 MOTT us \_\_\_\_\_ Oriented ?

- Message

## Question 8 who Created MOTT

- Andy tanford - Clark & Arden Nipper

Question 9 Explain the Component of Arduino?

- (a) Power USB: Arduino board can be powered by using the USB cable from your Computer
- (b) Power (barrel jack): Arduino board can be powered directly from the AC main Power Supply by connecting it to the barrel jack
- (c) Voltage regulator: Its function is to control the voltage given to the arduino board and stabilized the DC voltage
- (d) Crystal Oscillator: It helps arduino in dealing with time issues
- (e) Arduino Reset: you can reset your arduino. you can reset the UNO board in two ways. First by using reset button. you can connect an external reset button
- (f) Pin (3.3V, GND, VIN):
  - 3.3V - Supply 3.3 output volt
  - 5V - Supply 5 output volt
  - GND - these are several GND pins on Arduino
  - VIN - the Pin also can be used to power the arduino board

- (G) Analog Pins : the arduino uno board has six analog input pins a0 through a5. These pins can read the signals from an analog sensor like the humidity or temperature sensor
- (H) Main Microcontroller/Controller : you can assume it as the brain of your board. The main ic on the arduino is slightly different from board to board
- (I) ICSP Pin : Mostly ICSP (12) is an AVR, a tiny programming header for the arduino consisting of MOSI, MISO, SCK, RESET, VCC and GND
- (J) Power LED Indicator : this led should light up when you plug your arduino into a power source to indicate that your board is powered up correctly
- (K) Tx and Rx LEDs :  
Tx → transmit  
Rx → receive
- (L) Digital I/O : These pins can be configured to work as input digital pins to read logic values or as digital output pins to derive different modules like led, relay etc.

Question 10 Explain the operators used in Arduino IDE?

→ Arduino operators : An operators is a symbol that tells the Compiler to perform specific Mathematical or logical function

Type of operators :-

- Arithmetic Operators
- Comparison Operators
- Boolean Operators
- Bitwise Operators
- Compound Operators

(a) Arithmetic Operators :-

These include "+" (Addition), "-" (Subtraction), "▲" (Exponentiation), "\*" (Multiplication), "/" (Division), "Mod" (Module)

(b) Comparison Operator :-

These include "==" (Equal to), "!=" (Not equal to), "<" (Less than), ">" (Greater than), "~~>=~~" (Greater than equal to), "<=" (Less than or equal to)

(c) Boolean Operators :

These include "||" (And), "||" (Or), "!" (Not)

(d) Bitwise Operator : - these include "S" (And), "I" (Or), " $\wedge$ " (Xor), " $\sim$ " (not)

## Compound Operators:

These include "++" (increment), "--" (decrement), "+=" (Compound addition), "-=" (Compound subtraction), "\*=" (Compound Multiplication), "/=" (Compound division), "%=" (Compound Module)

Question 11 Explain Switch Case in a Arduino IDE?

Switch Case Control the flow of Program by allowing the Programme to specify different Code that should be Executed in various Condition a Switch statement Compares the value of a variable to the values specified in the various Case Statement

Syntax:

Switch (variable)

{

Case Label:

// statements

break;

}

Case Label:

{

// statement

break;

}

Question 12 How can you manipulate string array in arduino

→ we can alter a string array within a sketch as shown the following sketch

Example:

void setup()

{

char like [] = "I like Coffee and Cake"; // Create a string

Serial.begin (9600);

// (1) Print the string

Serial.println (like);

// (2) delete part of the string

like [13] = 0;

Serial.println (like);

// (3) Substitute a word into the string

like [13] = "j" // replace the null terminator with a space

like [18] = "t";

like [19] = "e";

like [20] = "a";

like [21] = "o";

Serial.println (like);

}

void loop()

{

}

Question 13 Write a Program in Arduino IDE to Convert string from lower Case to upper Case?

Void Setup ()

{

Serial.begin (9600);  
while ((Serial) {

}

Serial.println ("In In String Case changes :");  
Serial.println ();

}

Void Loop () {

String StringOne = "<html><head><body>";  
Serial.println (StringOne);  
StringOne.toUpper ();  
Serial.println (StringOne);

String StringTwo = "<Body><html>";  
Serial.println (StringTwo);  
StringTwo.toLower ();  
Serial.println (StringTwo);  
while (true);

Question 14 What is the microcontroller used in Arduino UNO;  
→ ATmega 528p

## Question 15 Difference between IoT and wOT

IoT

wOT



- |   | IoT   | wOT  |
|---|---|--|
| 1 | Custom Converter for every Protocol   | No Risk as the web is open always  |
| 2 | Assembly of Custom Code is a Risky task                                       | Any device can be accessed using standard web protocol                     |
| 3 | It is about Creating a network of object thing people, System and application | Connecting different device to the web makes the Integration across system |