

Answer all the questions.

1. What is the internet of things (IoT)? Explain its working mechanism with example? [2+8 marks]
2. What is the application of IoT in Traffic Management? Provide simple work flow for Smart Home with example? [2+8 marks]
3. What are the challenges or risks associated with IoT? [10 marks]

-THE END-

1. What is the internet of things (IoT)?

Model Answer

Internet of Things (IoT) is a network of physical objects or people called “things” that are embedded with software, electronics, network, and sensors that allow these objects to collect and exchange data. The goal of IoT is to extend to internet connectivity from standard devices like computer, mobile, tablet to relatively dumb devices like a toaster.

Marks Allocation

Award 2 marks for definition. (2 marks)

Explain its working mechanism with example?

Model Answer

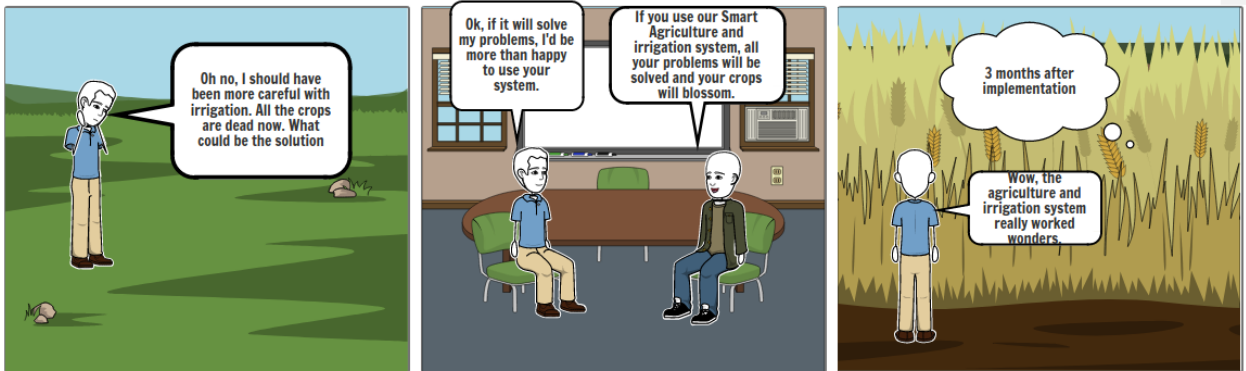
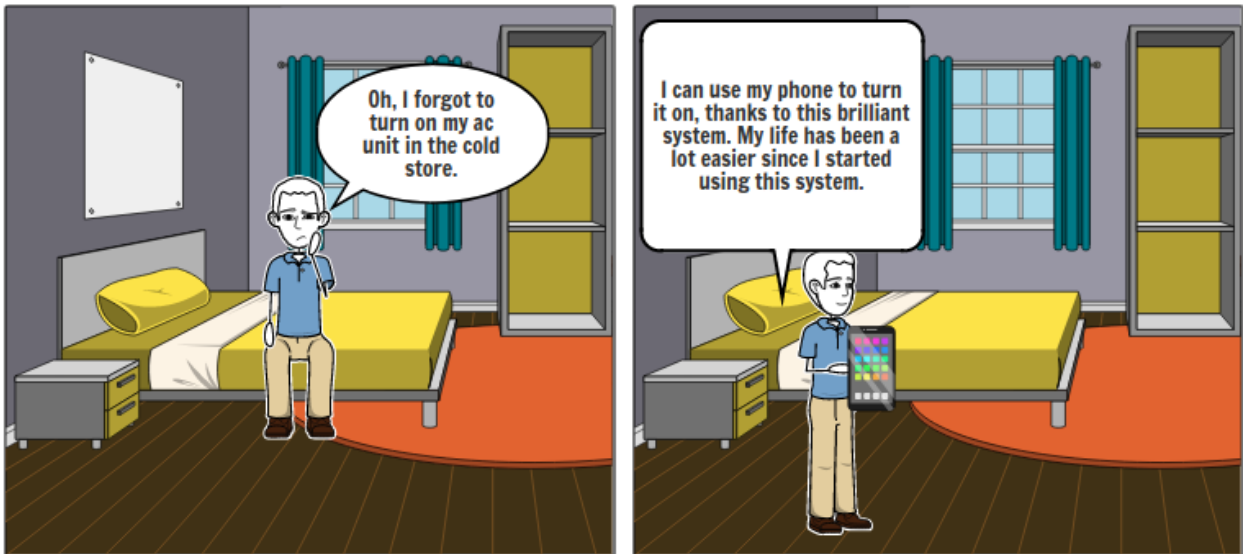
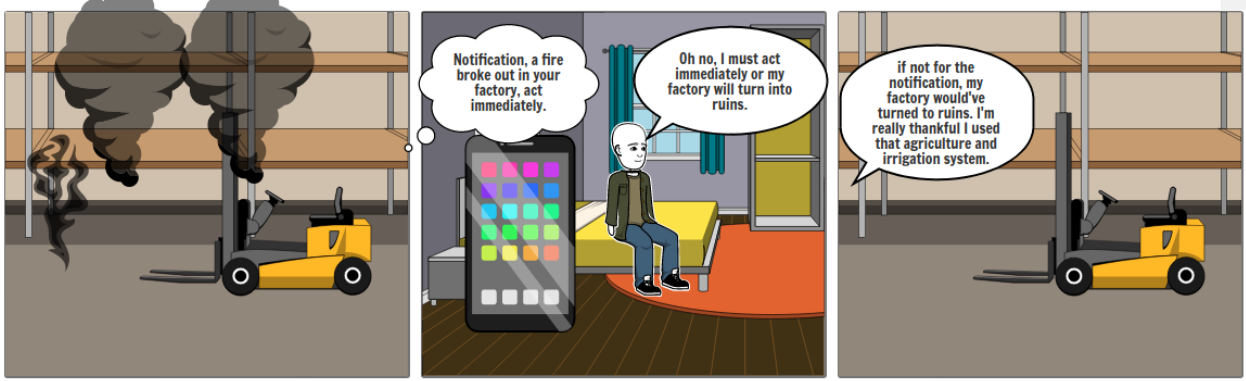
The internet of things, or IoT, is **a system of interrelated computing devices, mechanical and digital machines**, objects, animals or people that are provided with unique identifiers (UIDs) and the ability to transfer data over a network without requiring human-to-human or human-to-computer interaction.

Example:

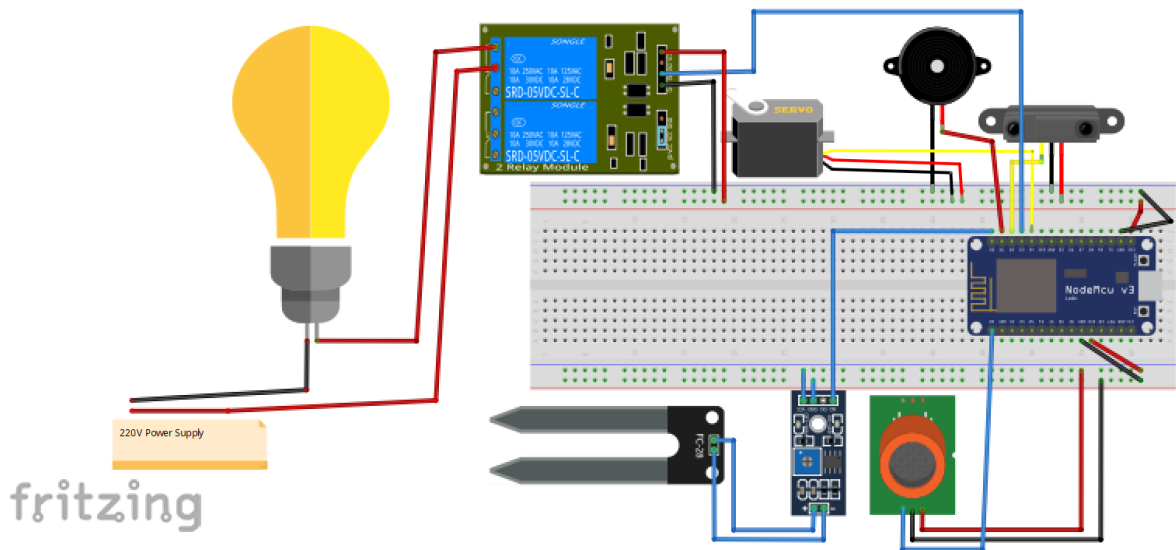
Title: **Smart Agriculture and irrigation system**

Smart Agriculture and irrigation system aims to provide smart irrigating and department solutions for the farmers. With the use of different IoT components it will provide aids to farmers. IR sensor will be used inside the store to prevent intruders of unauthorized access. Fire sensor to give alarm to the farmers when store will catch fire inside the store. Soil moisture will detect the degree of moisture in the soil and servo will rotate as per the instruction. NodeMCU will frequently update data generated by sensors and notification will be sent in the smartphones of the farmers through use of firebase.

How the system works:



Circuit Diagram:



Connection:

Flame sensor	NodeMCU
A0	A0
VCC	3V
GND	GND
IR	
o/p	D2
Moisture sensor	
A0	D0
Servo	
Yellow	D4
Buzzer	
+	D2
Relay	
In	D3

Marks Allocation

Award 1 mark for example title. (1 marks)

Award 1 marks for each component (sensors or actuators) connected correctly in figure max 4 marks. (4 marks)

Award up to 3 marks for description of example.(3 marks)

2. What is the application of IoT in Traffic Management?

Model Answer

The application of IoT in Traffic Management is broad: Smart Traffic Signals, Smart Parking System.

Marks Allocation

Award 2 marks for correct definition. (2 marks)

Provide simple work flow for Smart Home with example

Model Answer

Take a reference from question-1

Marks Allocation

Award 1 mark for example title. (1 marks)

Award 1 marks for each component (sensors or actuators) connected correctly in figure max 4 marks. (4 marks)

Award up to 3 marks for description of example.(3 marks)

3. What are the challenges or risks associated with IoT?

Model Answer

- **Privacy:** Connected IoT devices are vulnerable to hacking. Many IoT devices collect and transmit personal data over an open network without encryption, making it easy for hackers to access. Hackers may also use cloud endpoints to attack servers.
- **Insufficient testing & Outdated product:** In a fast-paced market like IoT, many companies or manufacturers rush to start releasing their products and software without doing enough testing. Many of them don't provide timely updates as well. Unlike other devices such as smartphones, IoT devices are not updated, which can leave them

vulnerable to data theft. Thus, IoT devices should be tested thoroughly and updated as soon as new vulnerabilities are identified in order to maintain security.

- **Lack of knowledge and awareness:** Despite being a growing technology, people do not know much about IoT. A major security threat associated with IoT is the user's lack of knowledge and awareness of its capabilities. This poses a threat to all users.
- **Network Connectivity:** Network connectivity can be challenging for many IoT devices. Particularly if such devices are widely dispersed, in remote locations, or if bandwidth is severely limited.
- **Reliability:** Given the highly distributed nature of IoT devices, it can be difficult to ensure the reliability of IoT systems. Various conditions can affect the components that make up an IoT system, such as natural disasters, disruptions in cloud services, power outages, and system failures

Marks Allocation

Award 2 mark for each correct answer. (5 * 2 mark = 10 marks)

The End