**EMG 557 Internet of Things for Managers Assignment 2**

1. **Review following article from Deloitte University on Internet of Things and answer following questions.**

<https://www2.deloitte.com/content/dam/insights/us/articles/iot-primer-iot-technologies-applications/DUP_1102_InsideTheInternetOfThings.pdf>

1. What is Information value loop?
2. Explain augmented intelligence
3. What are the factors driving adoption within IoT
4. Explain data aggregation process
5. Elaborate on Machine enchantment hierarchy
6. Explain IoT architecture w.r.t.
   1. The IoT implementation view
   2. The IoT specifications view
   3. DevX Class is going great
   4. Softskills class
   5. Softskills Github

**B. Answer following short questions:**

1. What is Embedded System?
2. Write two examples of applications where remote use of actuators will come into play using the control signal from Web of decision based on cloud data analytics.
3. What is SoC?
4. What are the difference between MPU and MCU?
5. What are the difference between Microprocessor and Microcontroller?
6. In the context of basic sensor data acquisition and actuator control only which will be more suitable MPU or MCU, justify your answer.
7. What is OSI layer architecture? Write all 7 layers.
8. Internet is governed by layered Architecture, why? What is the advantage of the same?
9. What are the fundamental difference between TCP and UDP? Explain with suitable example which is preferable in which application scenario. Draw the header of TCP & UDP by demarking the fields with suitable data size.
10. What is MQTT? Show the encapsulation diagram of MQTT. Show the messageexchange in a MQTT broker and client.
11. Explain the working of Domain Name System (DNS) with suitable diagram bychoosing suitable network and DNS server and client. Show the hierarchical structure.
12. ESP8266 Pin specification & working with two AT Commands
13. Write IEEE 802.3 Ethernet MAC Frame format with suitable fields and their functions.

**C. Answer following Long Questions:**

1. Explain the working of NTC (negative temperature coefficient) thermistor with suitable Circuit.

2. What is a hygrometer? What are the parameters a hygrometer measures? Explain the working of hygrometer with suitable diagram.

3. Which kind of moisture sensor is used in DHT11 Sensor for IoT prototyping? Explain the working of DHT11.

4. Explain the working of MQ Series gas sensor with suitable circuit diagram. Also comment how the gas concentration is detected using a example of MQ-135 Sensor Rs/Ro vs PPM plots for different gasses.

5. Explain with suitable diagram the working of Ultra sonic sensor. Design a IoT application using a ultra-sonic sensor using suitable block diagram.

6. Describe the working of IR Sensor using suitable diagram of a IR TX-RX. What kind of typical IoT applications can be designed using IR LED and IR detector? Give one such design using block diagrm.

7. Explain the working of magnetic hall sensor. Where such sensors can be useful in IoT application? Design on such application using suitable block diagram.

8. Explain the working of X-Y-Z three-axis accelerometer. Design your own IoT application using a three-axis accelerometer using suitable bock diagram.

9. Describe Arduino UNO development board with different types of pins available with proper technical specifications and the steps to connect the Arduino and program it using which software in PC.

10. Explain OSI layer architecture. Mention the role & responsibility, working, Payload,

addressing and examples of protocols for each layer.

**D.** What is Amazon Web Services (AWS)? Design a simple IoT application using AWS

cloud for sending any sensor data to the cloud. Why a cloud platform is preferable

over local storage? Justify in the context for your design.

Your IoT application design must include the following:

(a) Block diagram / Connection diagram

(b) Step by step process to develop the project & prototype

(c) Pseudo code of program

Expected output / a Visualization in AWS cloud

**E.** What are difference between IPv4 and IPv6? Write 5 points with suitable

explanations.

**F.** Consider you are going to establish a start-up company in IoT. Explain step by step

the process of IoT product development life-cycle.

Write a suitable case-study of your own.