



**UNIVERSITI TUN HUSSEIN ONN MALAYSIA**

**FINAL EXAMINATION  
(TAKE HOME)  
SEMESTER II  
SESSION 2020/2021**

**COURSE NAME : IOT CIRCUIT DESIGN**

**COURSE CODE : MET11403**

**PROGRAMME CODE : MET**

**EXAMINATION DATE : JULY 2021**

**DURATION : 3 HOURS**

**INSTRUCTION : ANSWER ALL QUESTIONS**  
**OPEN BOOK EXAMINATION**

THIS QUESTION PAPER CONSISTS OF **THREE (3)** PAGES

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- Q1 (a)** Design a read live web data for vessels using data from the MarineTraffic website (<https://www.marinetraffic.com/en/ais/details/ports/>), which provides information on traffic at a port.
- (i) By specifying the URL, write a MATLAB® script for accessing the information on vessels at the port using a code template in ThingSpeak Apps (MATLAB Analysis). (3 marks)
- (ii) Then, write a full MATLAB® script to evaluate the latest live data from a website and display it in the ThingSpeak Apps. Charts in your ThingSpeak channel should be populated with a single point representing a field in the website data. (12 marks)
- (b)** Create Dew Point Measurement channel that able to read temperature and humidity data from ThingSpeak, which collects weather-related data from an Arduino® device. Use MATLAB Analysis & Visualizations Apps to evaluate the results of the channel. (10 marks)
- Q2** Application programming interface (API) is an interface used by programs to access an application. It allows a program to send commands to other programs and receive responses from that application based on specific data format, method of sending the data, and messaging or communication protocol.
- (a)** Describe the relationship between the terms HTTP, REST, and JSON which are commonly used terms in the API. (6 marks)
- (b)** HTTP-based APIs are common on the web. However, there is a large growth of MQTT-based APIs, especially for IoT applications.
- (i) Differentiate between HTTP and MQTT. (6 marks)
- (ii) By giving one example of API service for IoT, design the command settings for the HTTP-based and MQTT-based APIs. (13 marks)
- Q3 (a)** As a junior system design engineer, you are given the task to develop and design a new IoT system. Deduce all the steps involved in the development process. (15 marks)

- (b) In the current trend, people are following the modern approach for better agriculture management aim to achieve the maximum utilisation of the tools (sensors) for better agriculture requirements. Identify types of sensors used in agriculture and suggest how they can be utilised. (8 marks)
- (c) Describe the challenges in IoT. (2 marks)

**-END OF QUESTIONS-**