UOW MALAYSIA KDU PENANG UNIVERSITY COLLEGE

PART OF THE UNIVERSITY OF WOLLONGONG AUSTRALIA GLOBAL NETWORK

School of Engineering, Computing and Built Environment

Department of Computing

Bachelor of Computer Science (Hons) / Bachelor of Computer Science (Hons) in Computer and Network Technology / Bachelor of Software Engineering (Hons) / Bachelor of Information Systems (Hons)

INTERNET OF THINGS (CET3063/N/CET3064)

September 2022 Semester

Final Examination

Duration: 2 hours

Total Marks: 100

Instructions

1. This examination paper consists of **2 pages**, including this cover page.
2. There are 2 sections: Section A (50 marks)
   Section B (50 marks)
3. Read carefully the instructions printed at the beginning of each section.
4. All answers are to be written in the answer booklet(s) provided. Use black or blue ink only. Pencils may be used for sketches and diagrams.
5. Examination paper and answer booklet(s) are **not allowed** to be taken out from the examination room.

Answer all questions in all sections.

Section A (50 marks)

1. Define and describe the terminology of an IoT system. (7 marks)

2. Discuss four advantages and four disadvantages of an IoT system. (8 marks)

3. Given two bit streams for master and slave registers below at time, t = 0, show the data representations for a byte of transfer in the MOSI line of SPI interface. (8 marks)

Table 1: Master and slave registers

Device	LSB							MSB
Master	1	0	1	0	0	0	0	1
Slave	0	0	0	0	0	1	1	1

4. Name and discuss four characteristics of a service-oriented architecture (SOA). (12 marks)

5. Identify and discuss five service components involved for an airport IoT system. (15 marks)

Section B (50 marks)

1. Write an Arduino code to read two strings of characters; firstName and lastName. (10 marks)

2. Draw the I^2C connections for two microcontroller units (MCUs). (8 marks)

3. Write a complete Arduino code to increase the intensity of a light-emitting diode (LED) that connects to a pulse-width modulation (PWM) pin of a MCU, with a step size of 16 for every two seconds. (13 marks)

4. Write a function in Arduino code to connect a MCU to a wireless local area network (WLAN) with a service set identifier (SSID), “Adam” and a password, “Eve@123”. Then, verify if there is a network coverage for this WLAN. (12 marks)

5. Fill in the blanks for the configuration of message queue telemetry transport (MQTT) protocol below. (7 marks)

```
const char* mqttServer = "io.com";
const char* serverPort = "8080";
___ espClient;
___ client(___);

void setup(){
  ___(___, ___);
  ___(callback);
}
```

THE END

Prepared by Dr. Khoo Hee Kooi
Department of Computing
School of Engineering, Computing and Built Environment