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UNIVERSITI TUN HUSSEIN ONN MALAYSIA

**FINAL EXAMINATION
SEMESTER I
SESSION 2021/2022**

COURSE NAME : INTRODUCTION TO INTERNET OF THINGS
COURSE CODE : MET10103
PROGRAMME CODE : MET
EXAMINATION DATE : JANUARI/FEBRUARY 2022
DURATION : 3 HOURS
INSTRUCTION : 1. ANSWER ALL QUESTIONS
2. THIS FINAL EXAMINATION IS AN ONLINE ASSESSMENT AND CONDUCTED VIA OPEN BOOK

THIS QUESTION PAPER CONSIST OF FOUR (4) PAGES

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- Q1** You have been asked to propose an architecture diagram for a parking system using the Internet of Things (IoT). As an IoT developer, you should identify device, technology and trust boundaries to design the proposed system. The client's requirement for the proposed system has to develop for Design 1 and Design 2, respectively, as stated in **Table Q1**.

With the aid of a suitable figure, propose the design that meets the requirements for Design 1 and Design 2, individually.

(10 marks)

- Q2** Information technology (IT) is essential in our lives because it helps deal with daily dynamic things. Moreover, technology offers various tools to boost the development and exchange of information. Both these things are the objective of IT to make tasks easier and solve many problems. Nowadays, a new trend of the Internet of Things (IoT) describes the network of things that are embedded with sensors, software, and other technologies to connect and exchange data with other devices and systems over the internet.

Identifies the difference between IT and IoT in terms of;

- (a) Scale (2.5 marks)
- (b) Constrained Devices and Networks (2.5 marks)
- (c) Data (2.5 marks)
- (d) Legacy Device Support (2.5 marks)

- Q3** Youth representation in political, economic, or social activities at the local, national and regional levels enriches the ASEAN identity and development. Enabling youth engagement contributes to a more sustainable and effective ASEAN development. With the growth of advanced technology, there is an evolution of the flow of information. This can act as a great advantage for all changemakers if they can employ the ever-evolving technology effectively. This can favourably benefit projects within regions like ASEAN, especially imperative in the light of the post-COVID-19 world, where the region is facing uncertainty and challenges.

Propose potential solution towards Smart technology IoT based whereby their integration will benefit in the following essential elements;

- Sustainable development in years to come will capitalize greatly on digitalization.
- Internet of things as essential tool for sustainable food production and planet health.
- Artificial intelligence can optimize energy production and water treatment.
- Smart technologies can provide equity access to services and increase well-being.
- Digitalization can guide actions to face climate change and protect biodiversity.

(25 marks)

- Q4** After years of hype, anticipation, and steady uptake, the IoT seems poised to cross over into mainstream business use. The number of businesses that use IoT technologies has increased from 13 percent in 2014 to about 25 percent today. And the worldwide number of IoT-connected devices is projected to increase to 43 billion by 2023, an almost threefold increase from 2018.

The IoT technology will become easier to implement, opening the door for a wider variety of companies to benefit from IoT applications. As frequent investors in medium-sized companies, private equity (PE) funds and IoT technology can help these companies create some significant value. Then be translated into business benefits for PE funds interested in becoming involved with the IoT as investors, owners, and partners.

- (a) What is a value proposition, why is it important to the business, and give **ONE (1)** example brand value proposition? (6 marks)
- (b) Explain the value proposition for investors and how to identify the value proposition for an investor? (6 marks)
- (c) Relates the partner value proposition. (6 marks)
- (d) Represent a value proposition in business model canvas. (7 marks)

-END OF QUESTIONS-

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Table Q1: Design Requirement

Design 1: Customer pays for a time in a parking spot	
Pre-conditions	A customer has installed a parking application onto a smartphone. Payment information has been made available for transactions using the parking application.
Use case	Customer opens parking application on a smartphone. Smartphone communicates with and collects data from parking applications and provide real-time location and pricing for nearby vacant spots. A customer drives to the spot. A customer uses a smartphone application to pay for the spot.
Post-conditions	A customer has paid to park a car for a set amount of time.
Design 2: Parking enforcement officer is alerted to non-payment incident	
Pre-conditions	The time allocated to a parking transaction has expired, and the car is still in the parking spot.
Use case	Parking application (backend) records parking session start time. IP video cameras capture video of the vehicle in the parking spot. Parking application correlates video of a car in a spot with start time and duration for parking transaction. System flags for video confirmation once transaction duration has expired. IP video cameras provide evidence that the vehicle is still parked. The parking application transmits an alert to the enforcement application. The enforcement officer receives an SMS alert and proceeds in-person to ticket the vehicle.
Post-conditions	The parking enforcement officer has ticketed the vehicle.