GENERAL SIR JOHN KOTELAWALA DEFENCE UNIVERSITY

Faculty of Engineering

Department of Electrical, Electronic and Telecommunication Engineering

BSc Engineering Degree

Semester 8 Examination – July 2021

(Intake 35 – ET/MC)

ET 4242 – INTERNET OF THINGS

Time allowed: 2 hours 7th July 2021

ADDITIONAL MATERIAL PROVIDED

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INSTRUCTIONS TO CANDIDATES

This paper contains five questions and answer all the questions on answer booklets.

This paper contains 4 pages with the cover page.

This is a closed book examination.

This examination accounts for 40% of the module assessment. A total maximum mark obtainable is 100. The marks assigned for each question and parts thereof are indicated in square brackets.

If you have any doubt as to the interpretation of the wordings of a question, make your own decision, but clearly state it on the script.

Assume reasonable values for any data not given in or provided with the question paper, clearly make such assumptions made in the script.

All examinations are conducted under the rules and regulations of the KDU.

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Question 1

The Internet of Things (IoT) is a system that allows devices to be connected and remotely monitored across the Internet.

a) Using suitable examples identify the types of IoT? [8 marks]

b) Using a sketch/diagram of interactions, illustrate how IoT reference model used for establishing an IoT application. Illustrate with an example. [7 marks]

c) Specify five main challenges of IoT. [5 marks]

Question 2

a) Explain the concept of Fog Computing. [4 marks]

b) Outline the importance of Fog Computing in IoT. [4 marks]

c) Explain two use cases for Fog Computing. State why you consider them to be stronger in using Fog Computing than Cloud Computing. [12 marks]

Question 3

It is identified that with a bulging world population and increasing urbanization which is set to grow by more than 10% in the next 30 years resulting in a total of 70% living in cities by 2050. The concept of Smart City become a major initiative by various governments in making cities more navigable and welcoming to the expected population increase and providing city dwellers a better living experience.

a) Using the Smart City as an example, explain the following components of it based on the aspects of collection of data, transmission/reception, storage, and analysis. [16 marks]

- Smart Agriculture
- Smart City Services
- Smart Health
- Smart Home

b) Explain how IoT useful in creating the smart city components which are given in part a). [4 marks]

Question 4

Wireless Sensor Network (WSN) can generally be described as a network of nodes that cooperatively sense and may control the environment, enabling interaction between persons or computers and the surrounding environment.

a) Explain the major function of the sensors used in IoT? [4 marks]

sensing,dataprocessing

b) Using the fire detection in a forest as an example, explain how the IoT integrated Wireless Sensor Network (WSN) can be used to create a solution for it. [10 marks]

c) Explain in what way the Node energy saving and security can be improved in part b) [6 marks]

Question 5

a) Describe the concept of IoT in security using a real time IoT application. [5 marks]

b) Explain why encourage of IPv6 deployment is useful in IoT security concern. [5 marks]

c) 'The rapid rate of change in IoT technology could outpace the ability of associated policy, legal, and regulatory structures to adapt.' Discuss this statement using the Smart Phone as an example. [5 marks]

d) Use a suitable example and explain how the IoT technology useful in Emerging Economy and Development in a country. [5 marks]

End of question paper