TECHNICAL UNIVERSITY OF MOMBASA

INSTITUTE OF COMPUTING AND INFORMATICS

Select department

UNIVERSITY EXAMINATION FOR:

BACHELOR OF SCIENCE IN INFORMATION TECHNOLOGY

CIT 4402: Internet of Things (IOT)

BSIT/Sep2021/S-FT and BTIT/Sep 2021/S-FT

END OF SEMESTER EXAMINATION

SERIES: December 2024

PAPER II

TIME:2HOURS

DATE: Pick DateSelect MonthPick Year

Instructions to Candidates

You should have the following for this examination

-Answer Booklet, examination pass and student ID

This paper consists of **FIVE** questions. Attemptquestion ONE (Compulsory) and any other TWO questions.

Do not write on the question paper.

Question ONE

a) Define the Internet of Things (IoT) (3 Marks)

b) Discuss the significance of IOT in today's technological landscape (6 Marks)

c) Describe the key components and functionality in an IoT device (8 marks)

d) Discuss the behavioral characteristics of IoT devices (4 Marks)

e) Explain the significant contributions from embedded systems, mobile computing, and wireless sensor networks towards the growth of IoT (9 Marks)

Question TWO

a) In the context of IoT, explain the privacy and security implications associated with the widespread use of interconnected devices (10 marks)

b) Provide examples of vulnerabilities that IoT devices are commonly exposed to (10 Marks)

Question THREE

a) Discuss the legal challenges associated with IoT (10 marks)

b) Discuss issues surrounding liability for data breaches and security vulnerabilities, especially with regard to consumer devices. (10 marks)

Question FOUR

a) Explain the significance of real-time analytics and streaming analytics in IoT environments (10 Marks)

b) Explain how these analytics contribute to decision-making processes in businesses (10 marks)

Question FIVE

a) Compare various communication protocols used in IoT (e.g., Bluetooth, NFC, and LoRaWAN) (10 Marks)

b) Explain the factors that influence the choice of protocol for a given IoT application (10 Marks)

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Question ONE

a) Explain terms like "smart objects," "the web of things," and "cooperating objects" relationship to IoT (5 Marks)

b) Explain how the intended use of an IoT device affects its design and functionality (5 Marks)

c) Describe the two core behaviors common to all IoT devices (4 marks)

d) Identify the major technologies that contribute to the development of IoT (7 Marks)

e) Describe context-aware computing and its importance in IoT applications (9 marks)

Question TWO

a) Discuss the enablers and barriers of IoT adoption (8 marks)

b) Explain how do technical and non-technical drivers influence the deployment of IoT systems within industries (12 Marks)

Question THREE

a) Discuss the concept of miniaturization in IoT devices**.** (8 Marks)

b) Explain Why size is a critical factor for IoT applications (6 Marks)

a. Discuss some of the implications of miniaturization on functionality and power consumption (6 Marks)

Question FOUR

a) Discuss the concept of cloud analytics (8 Marks)

b) Explain how cloud computing complement the analysis of big data generated by IoT devices, and the advantages they provide to organizations (12 Marks)

Question FIVE

a) Describe the roles of edge computing and fog computing in IoT architecture (10 Marks)

b) Explain how technologies in a) above improve the efficiency and latency of IoT applications (10 Marks)