MURANG'A UNIVERSITY OF TECHNOLOGY

SCHOOL OF COMPUTING AND INFORMATION TECHNOLOGY

DEPARTMENT OF INFORMATION TECHNOLOGY

UNIVERSITY POSTGRADUATE EXAMINATION

2024/2025 ACADEMIC YEAR

FIRST YEAR FIRST **SEMESTER** ONE EXAMINATION FOR

DOCTOR OF PHILOSOPHY IN INFORMATION TECHNOLOGY

SIT 900-TRENDS IN INFORMATION TECHNOLOGY

DURATION: 3 HOURS

INSTRUCTIONS TO CANDIDATES:

1. Answer any four questions.
2. Mobile phones are not allowed in the examination room.
3. You are not allowed to write on this examination question paper.

QUESTION ONE (25 MARKS)

a) Evaluate any 4 impacts of AI and machine learning on various industries and discuss any 4 potential ethical implications. (8 marks)

b) Identify any 5 key industries where AI/ML have significantly disrupted traditional practices. (5 marks)

c) Analyse 3 specific benefits and 3 challenges associated with AI adoption in these industries. (6 marks)

d) Discuss any three ethical concerns related to AI/ML. (6 marks)

QUESTION TWO (25 MARKS)

a) Analyze and give examples of any 4 potentials of internet of things (IoT) to transform industries/society. (8 marks)

b) Examine any 7 challenges and 4 opportunities associated with IoT adoption. (7 marks)

c) Explain how cloud computing can be used to optimize the scalability and cost-effectiveness of IT infrastructure for a medium sized enterprise. (10 marks)

QUESTION THREE (25 MARKS)

Cloud computing offers significant benefits for organizations yet its adoption comes with various challenges. An E-commerce company is considering moving its entire infrastructure to a public cloud and increase stability. Critically assess whether this is a wise decision for the company considering the potential risks and benefits. In your analysis focus on the following.

i. Explain 2 ways in which the company may ensure the protection of sensitive data on the cloud. (4 marks)

ii. Discuss 5 measures they should take to comply with data protection regulations. (5 marks)

iii. Discuss any 4 companies' operational efficiency that would be improved significantly by moving to the cloud or could there be unforeseen issues. (8 marks)

iv. Examine any 4 cost-saving benefits of using the public cloud worth the reduced control over IT infrastructure. (8 marks)

QUESTION FOUR (25 MARKS)

Block-chain is widely known for its association with crypto-currency though it has broader applications.

(a) Demonstrate how block-chain technology can be applied in supply chain management to improve transparency and reduce fraud. (10 marks)

(b) Analyse any 5 scalability issues associated with block chain adoption in enterprise systems. Consider trade-offs between decentralization and system performance. (10 marks)

(c) Evaluate 5 potentials of block-chain technology to revolutionize industries outside finance. Provide your conclusions with supporting arguments. (5 marks)

QUESTION FIVE (25 MARKS)

An organization increasingly relies on big data for its decision making though data privacy concerns are on the raise.

(a) Explain any 5 ways in which big data analytics can improve customer- experience in retail, providing specific examples of how data is collected and analysed. (10 marks)

(b) Analyse any 5 trade-offs between leveraging big data and protecting customer privacy, considering the role of data anonymization and consent. (10 marks)

(c) Evaluate the effectiveness of current data protection regulations in Kenya in ensuring privacy while allowing business to utilize big data. (5 marks)