CERTIFIED PUBLIC ACCOUNTANT

FOUNDATION LEVEL 2 EXAMINATIONS

F2.3: INFORMATION SYSTEMS

DATE: TUESDAY, 30 NOVEMBER 2021

INSTRUCTIONS:

1. **Time Allowed: 3 hours 15 minutes** (15 minutes reading and 3 hours writing).
2. This examination has **seven** questions and only **five** questions **should be** attempted.
3. Marks allocated to each question are shown at the end of the question.
4. The question paper should not be taken out of the examination room.

QUESTION ONE

Ms Kampeta Patience is a director in one of the major government institutions in charge of policy decisions regarding Information Systems and Technology. In October 2011, Ms Kampeta attended a virtual global summit discussing a number of Information Technology (IT) issues including instituting strategic IT policies in the private sector in all national jurisdictions, promoting e-government and the general digitalisation of the economy, and the promotion of the usage of various enterprise applications and information systems by firms to better manage their business operations and data. Ms Kampeta was pleased to hear the recognition of Rwanda for its impressive progress in e-government evidenced by the famous Irembo platform. You are an IT Strategist working under Ms Kampeta's office and she has asked you to advise on a number of aspects.

Required:

a) **Advise Ms Kampeta on SIX primary strategic business objectives of investing in information systems.** (6 Marks)

b) **Differentiate a Digital Economy from a Digital Firm.** (4 Marks)

c) Briefly describe the following enterprise applications and information systems:

   i. **Enterprise Resource Planning (ERP) Systems** (2 Marks)

   ii. **Supply Chain Management (SCM) Systems** (2 Marks)

   iii. **Customer Relationship Management (CRM) Systems** (2 Marks)

   iv. **Knowledge Management Systems (KMS)** (2 Marks)

   v. **Decision-Support Systems (DSSs)** (2 Marks)

(Total: 20 Marks)

QUESTION TWO

You are a Cyber Security Manager (CSM) in NKURINDE Ltd, an information technology company located in Kigali Innovation City. Your supervisor has sent you the following e-mail:

'From: kagabo@nkurinde.rw

To: uwicyeza@nkurinde.rw

20 October 2021

Subject: Thoughts about recent cyber security issues

Hi CSM,

Hope you are well today. The recent cyber threats got me thinking: Rwanda's financial sector is growing and becoming competitive. Over the past few years there has been growth of digital or electronic payments and services. With growth of e-banking systems, Rwanda's financial sector is becoming vulnerable to cyber security threats and fraud. The National Bank of Rwanda (BNR) has warned that the local banking sector is prone to cyber fraud. Although cybercrimes are threatening companies all over the world, the risk is higher for African businesses and banking sector. It is important for companies to establish strong computer system controls, but few have them.

The implications and impacts of cyber security issues are enormous. This discourages people from opting for online banking and thus affecting competitiveness of banks in Africa. People who already have a bank account are reluctant to adopt e-banking. It is also an obstacle to drawing those who don't have bank accounts into the formal financial system.

Please address the following questions in preparation for a session I have with the Rwanda Bankers' Association (RBA) this week.

Best regards

Kagabo'

Required:

a) **State why computer-based systems tend to be more vulnerable to damage, error, and fraud than manual systems.** (4 Marks)

b) **Differentiate between spoofing and sniffing attacks.** (4 Marks)

c) **Explain SIX principal general information system controls that companies can establish to strengthen their information technology infrastructure control environment.** (12 Marks)

(Total: 20 Marks)

QUESTION THREE

You are an Information Technology Analyst in Ramba Tech, a Rwandan computer hardware company located in Rusizi Tech Hub. Your Chief Executive Officer (CEO), who is not tech savvy, recently read a book on computer hardware. The CEO shared the following extract from the book to you:

'Computer hardware, software, and networking technology have revolutionized how businesses organize their computing power. These trendy technologies are gradually transferring computing power to networks and mobile handheld devices and obtaining more of their computing capabilities in the form of services. Some of the main hardware trends include: the mobile digital platform, consumerization of information technology, quantum computing, virtualization, cloud computing, edge computing, green computing, and high-performance/power-saving processors.

Required:

The CEO has requested you to kindly address the following issues for better understanding:

a) **Outline FOUR advantages and FOUR disadvantages of Cloud Computing**. (8 Marks)

b) Briefly describe the following trendy technologies:

i. **Virtualization.** (2 Marks)

ii. **Quantum computing** (2 Marks)

c) **Discuss FOUR main trends in contemporary software platforms.** (8 Marks)

(Total: 20 Marks)

QUESTION FOUR

You are a Chief Information Officer (CIO) at MURANDASI Telecom, a leading Rwandan tech firm dealing in physical and wireless transmission media. The management of MURANDASI Telecom recently sent you to a Global Mobile Broadband Forum in South Asia where a number of interesting topic were discussed by leading tech minds. Some of the topics discussed include wireless industry trends, physical transmission media, and blockchain technology. You have

been requested to share address the following inquiries made by members of the board of directors of MURANDASI Telecom to help them better understand the concepts in question.

Required:

a) **Tabulate THREE types of physical transmission media used by networks clearly indicating the type, brief description, and speed for each type.** (6 Marks)

b) **Distinguish between Leased Line and Digital Subscriber Line (DSL) broadband network service technologies.** (4 Marks)

c) **Define the term blockchain.** (1 Marks)

d) **Demonstrate how the Domain Name and Internet Protocol (IP) Addressing System works.** (6 Marks)

e) **List THREE devices for wireless transmission.** (3 Marks)

(Total: 20 Marks)

QUESTION FIVE

You are an Information Technology (IT) expert advising a major government agency on various IT aspects especially electronic commerce (e-commerce) and mobile commerce (m-commerce). Your grandmother, located in rural Ngororero District, recently got the news of your employment and how important you are from a long-time old friend who recently returned home to check on her parents and ended up meeting your grandmother in church. Your grandmother was excited about your role, and she called you later in the evening. In your conversation, she asked for clarification on several electronic commerce and mobile commerce aspects as she recently heard a related program on radio.

Required:

a) **State FIVE of the of the most important Internet business models for electronic commerce**. (5 Marks)

b) **Briefly describe FIVE e-commerce benefits to businesses.** (5 Marks)

c) **State SIX categories of m-commerce services.** (6 Marks)

d) **Mention FOUR unique features that make the Internet and e-commerce technologies richer and more powerful than previous technology revolutions such as radio, television, and the telephone.** (4 Marks)

(Total: 20 Marks)

QUESTION SIX

Kimironko Referral Hospital is a hospital that provides tertiary care, which is a level of health care obtained from medical specialists in the country after referral from the providers of primary care and secondary care in all districts of Rwanda. In early 2020 when the country was grappling with the impact of the COVID-19 pandemic, many hospitals struggled to deal with new ways of medical services provision including a blend of physical and virtual consultations and care amid lockdowns. To keep up with the new ways of handling their patients, Kimironko Referral Hospital embraced big data to help make better treatment decisions. The hospital introduced an enterprise-wide knowledge management system that helps healthcare professionals in the hospital keep up with the knowledge in their fields, make better treatment decisions, and manage costs. The hospital developed massive volumes of data on patients and their related treatments that is structured, unstructured, and contains qualitative reports. Kimironko Referral Hospital uses an artificial intelligence platform to analyse and report on data. The hospital also considers hiring knowledge workers. However, this is still new, and few staff understand how the systems works and whether it is useful.

Required:

You are a Knowledge Manager and you have been requested by Kimironko Referral Hospital to prepare a report, addressed to the Chief Medical Officer (CMO) at the hospital, that addresses the following issues. The report will be shared with all staff:

a) **Differentiate between Artificial Intelligence (AI) and Machine Learning (ML)**

(3 Marks)

b) **Discuss THREE main categories of enterprise-wide knowledge management system that Kimironko Referral Hospital can use.** (6 Marks)

c) **Outline THREE key roles that knowledge workers at Kimironko Referral Hospital will perform.** (3 Marks)

d) **With reference to its key components, illustrate and explain how a typical expert system works.** (8 Marks)

(Total: 20 Marks)

QUESTION SEVEN

University of Gasyata (UoG) is a newly established state-of-the-art university that offers courses in technology, business, and many others. It has a vision of educating the next generation of leaders and innovators in Rwanda and beyond. The university is in the process of developing a modern library that will provide both hard and soft resources for students, staff, and researchers alike. It is estimated to serve tens of thousands of users monthly. The university administration has approached Ubaka Tech Ltd, a company that specialises in systems development and related services, to provide the library development services including the development and submission of a feasibility study. You are the Chief Developer at Ubaka Tech Ltd.

Required:

As a Chief Developer at Ubaka Tech Ltd, please consider the following aspects:

a) **Discuss core activities Ubaka Tech Ltd will follow in developing the library system for the UoG.** (12 Marks)

b) **Illustrate and describe the four-step model of a prototyping process for a system to users.** (5 Marks)

c) **State THREE benefits of outsourcing information systems to organisations.**

(3 Marks)

(Total: 20 Marks)

End of question paper

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