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## **CERTIFIED PUBLIC ACCOUNTANT**

## **FOUNDATION LEVEL 2 EXAMINATIONS**

### **F2.3: INFORMATION SYSTEMS**

**DATE: TUESDAY 25, APRIL 2023**

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### **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. Show all your workings where necessary.**
- 5. The question paper should not be taken out of the examination room.**

## QUESTION ONE

Jewe E-Commerce Business is a business that deals with selling Made in Rwanda jewelry and accessories online. The business owner, Mukandayisenga, has always been interested in entrepreneurship and saw the potential for a success with an e-commerce platform.

Mukandayisenga set up an online store and began marketing her products through social media and online advertising. She is now able to generate a decent amount of traffic to her site and has started making sales. However, as the business grows, Mukandayisenga begins to face a number of challenges. One of the biggest issues is how payments will be made online. She is using a third-party payment method that is not always reliable, and she has had to deal with several instances of fraud. This has led to the lost sales and angry customers.

Another challenge is shipping and delivery. Mukandayisenga is handling all of the shipping and delivery by herself, which is becoming increasingly time-consuming and expensive. She is also having difficulty finding a reliable shipping provider that can handle the volume of orders she is receiving. To address these challenges, Mukandayisenga decides to invest in a more reliable payment method and considers using a fulfillment service for shipping and delivery. She has also started researching best practices for e-commerce businesses and implementing them in her own company.

**Required:**

- a) **Discuss seven ways in which information technology and systems are transforming business today referring to the Jewe E-Commerce Business. (7 Marks)**
- b) **Mention seven major management challenges involved in building and using information systems in organisations such as Jewe E-Commerce business. (7 Marks)**
- c) (i) **Distinguish computer literacy from information systems literacy. (2 Marks)**  
(ii) **Discuss information system from both business and technical perspective. (4 Marks)**

**(Total: 20 Marks)**

## QUESTION TWO

Gahizi Retailer is a company incorporated in Rwanda that has been in business for many years.

They sell diversified products, including food, beverages, home goods, and more. The Gahizi company has always been a brick and mortar store sales where customers walk in to buy products and had not yet ventured into e-commerce. However, with the rise of online shopping and the COVID-19 pandemic, in-store sales has seen a decline in foot traffic and sales.

In response, the owner of Gahizi Retailer decided to launch an e-commerce platform. They partnered with a very well-known e-commerce platform provider and set up an online store.

The owner also invested in digital marketing efforts to drive traffic to the online store. The launch of the e-commerce platform was a success. Consumers are now able to easily browse and purchase products online, and the company sees a significant increase in online sales. The owner was pleased with the results and decided to continue expanding the e-commerce aspect of the business.

However, the owner also recognizes the importance of maintaining a strong in-store sales. They invested in store renovations as they also offer a "buy online, pick up in store" option for customers who prefer to shop online but still want the convenience of in-store pickup. The combination of a strong online and in-store presence helps in-store sales adapt to the changing retail landscape and meet the needs of consumers.

The owner is able to successfully navigate the shift to e-commerce while still maintaining the traditional aspects of the business that have made it successful for so many years. By the use of big data analytics, e-commerce companies such as Gahizi Retailer can form a round view of the customers. This view will allow Gahizi Retailer to segment customers based on their preferences, location, and social media presence.

### Required:

- a) **Discuss three management issues Gahizi Retailer will face associated with electronic business.** (6 Marks)
- b) **Big data can lead to a wide range of insights and benefits. Outline at least eight insights and benefits of Big Data.** (8 Marks)
- c) **Discuss at least six internet business models for electronic commerce that Gahizi Retailer can use.** (6 Marks)

**(Total: 20 Marks)**

### QUESTION THREE

Online Shoes Shop is a growing e-commerce business that sells a range of trendy clothing and accessories. As the business expands, the owner, Sarah, finds that she is struggling to keep up with the increasing demand and complexity of running an online store. Sarah begins to do a research about

e-commerce governance applications that can support the operation of her business. After considering several options, she decides to go with a well-known platform that offers a range of features specifically designed for e-commerce businesses.

Some of the features Sarah is most interested in include inventory management, order processing, customer relationship management, and marketing automation. She is also impressed by the platform's ability to integrate with other systems and processes, such as accounting software and shipping carriers. Sarah has set up an e-commerce application and began using it to manage her online store. She finds that it greatly simplifies many of the tasks involved in running an e-commerce business, such as tracking inventory levels and processing orders. It also allows her to easily manage customer relationships and target marketing efforts.

In addition to the basic features of the e-commerce application, Sarah also takes advantage of the option to customize it for her specific business. She works with the platform's development team to add customized features and functionality that are tailored to her business needs.

Overall, Sarah is very satisfied with the e-commerce application and the support it provides for the operation of her business. It allows her to focus on other aspects of the business, such as product development and customer service, while the platform handles the behind-the-scenes tasks. As a result, Online Shoes Shop is able to continue growing and expanding successfully.

#### Required:

- a) Discuss three main external sources of software that Online Shoes Shop could have chosen to use. (4 Marks)
- b) Discuss the six main trends in contemporary software platforms. (6 Marks)
- c) Briefly discuss three types of physical transmission media used to carry messages from one device to another. (3 Marks)
- d) Outline seven major trends in telecommunications. (7 Marks)

(Total: 20 Marks)

#### QUESTION FOUR

Consider the following set of requirements for a company that needs a database.

Agahozo Inc is an engineering firm with approximately 500 employees. A database is required to keep track of all employees, their skills, assigned projects, and departments in which they work. Every employee has a unique number assigned by the firm, a name, and date of birth. If an employee is married to another employee of the firm, the data of the marriage and who is married to whom must be stored; however, no record of marriage is required if an employee's spouse is not an employee of the firm.

Each employee has a job title. Each employee does only one type of job at a time, and we only need to retain information about an employee's current job. There are 11 different departments in the firm, each with a unique name. An employee can report only to one department. Each department has a phone number. To procure various types of equipment, each department deals with many vendors. A vendor typically supplies equipment to many departments. We need to store the name and address of each vendor and the date of the last meeting between a department and a vendor.

Many employees work mostly on projects. An employee can work on many projects, but can only be assigned to at most one project in a given city. For each city, we are interested in its state and population. An employee can have many skills, but they can use only a given set of skills on a particular project. Employees use each skill that they possess in at least one project.

Each skill is assigned a number, and we will record a short description of each skill. Projects are distinguished by project numbers and we must store the estimated cost of each project.

#### Required:

- a) Discuss four kinds of organizational changes that building and implementing a new information system for Agahozo Inc. can bring. (8 Marks)
- b) Discuss seven activities involved in system development after developing a database for Agahozo Inc. (7 Marks)
- c) Explain three Agahozo Inc. information system development management challenges and two possible solutions. (5 Marks)

(Total: 20 Marks)

## QUESTION FIVE

Mr. Chips's fries is not just fries but an outcome of dedicated efforts by farmers, its suppliers, distribution centre and a firm promise by Mr. Chips. Mr. Chips contributes a great back end process which enables you to enjoy your favourite fries for that, the supply chain truly acts as a backbone of the business. The supply chain begins at the grass root level, with the suppliers receiving the crop from the farmers. The crop is then processed and dispatched to the distribution centres in special temperature controlled trucks, which ensures that the quality of the items is not compromised.

These items are stored in rooms with different temperature zones and are finally dispatched to the Mr. Chips's restaurants on the basis of their requirements. Mr. Chips's expectation of cold, clean, and on-time delivery plays a very vital role in maintaining the integrity of the products throughout the entire cold chain. Mr. Chips's supply chain is a complex web of direct and indirect suppliers. They manage this complex process by working with direct suppliers who share the company values and vision for sustainable supply. The company holds them to clear standards of quality, safety, efficiency and sustainability. It expects them to extend those requirements to their suppliers.

### Required:

- a) Briefly explain five supply chain processes that Mr. Chips's products undergo. (5 Marks)
- b) Briefly discuss the customer relationship management systems. (2 Marks)
- c) Mobile customer relationship management applications provide additional support for sales and service activities at the point of customer interaction. Outline four ways in which Wireless customer relationship management assists sales and field service professionals. (4 Marks)
- d) Define enterprise resource planning. (1 Marks)
- e) Briefly outline eight benefits organisations can gain from implementing ERP systems. (8 Marks)

**(Total: 20 Marks)**

## QUESTION SIX

You have been hired as the Chief Information Security Officer of Ihozo company. The senior management suspects that a large number of their internal network devices are not configured according to best security practices, but notes that they never had enough staff to analyze their thousands of devices. Some security controls need to be put in place to prevent hackers from hacking their systems.

### Required:

- There are six principal general controls you can initiate at Ihozo Company to prevent hackers from hacking their systems. Discuss fully each of the principals. (6 Marks)
- Explain three risk mitigation strategies that Ihozo Company can adopt. (6 Marks)
- Explain briefly eight reasons why computer based systems tend to be more vulnerable to damage, error, and fraud than manual systems. (8 Marks)

(Total: 20 Marks)

## QUESTION SEVEN

Normally data mining which is also referred to as knowledge discovery in databases is the process of discovering patterns in large data sets involving methods at the intersection of machine learning, statistics, and database systems. To ensure the quality of decisions taken by managers, data must be processed.

### Required:

- Define Knowledge management briefly. (1 Mark)
- Outline the three main categories of knowledge management systems (3 Marks)
- Knowledge workers perform five key roles in an organization. Briefly outline the roles they perform. (5 Marks)
- Outline at least four difficulties of implementing knowledge management systems. (2 Marks)
- What are the five steps used for businesses to obtain value for knowledge management systems. (5 Marks)
- Discuss how the expert system is different from neural networks. (4 Marks)

(Total: 20 Marks)

**End of question paper.**

