CERTIFIED PUBLIC ACCOUNTANT

FONDATION LEVEL 2 EXAMINATIONS

F2.3: INFORMATION SYSTEMS

DATE: TUESDAY, 29 NOVEMBER 2022

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

Kigali Appline Company is a regional brokerage firm that has been successful over the last several years. Competition for customers is intense in this industry. The large national firms have very deep pockets, with many services to offer clients. The severe competition also comes from discount and Internet trading companies. However, Kigali Appline Company has been able to cultivate a substantial customer base of upper-middle-income clients in Rwanda. To maintain a competitive edge with its customers, Kigali Appline Company is in the process of modernizing its online trading system. The modernization will add new features to the existing system and expand the range of interfaces beyond desktop and laptop computers to include tablet computers and smartphones. The system will add Twitter messaging in addition to continued support for traditional e-mail. Manzi, the project manager, is in the process of identifying all the groups of people who should be included in the development of the system requirements. He is not quite sure exactly who should be included. A typical feasibility report will be needed by Kigali Appline Company to check the feasibility of that project.

Required:

(a) **Discuss four parts that will likely be included in Kigali Appline Company's feasibility study report.** (8 Marks)

(b) **Explain the six activities in system development needed in producing a trading information system for Kigali Appline Company.** (12 Marks)

(Total: 20 Marks)

QUESTION TWO

Kagobi University registrar's office maintains data about the following :

i. Courses: Attributes are number, title, credits, syllabus, and prerequisites;

ii. Course offerings: Attributes are course number, year, semester, section number, instructor(s), timings, and classroom;

iii. Students: Attributes are student-id, name, and program;

iv. Instructors: Attributes are identification number, name, department, and title.

Further, the enrollment of students in courses and grades awarded to students in each course they are enrolled in must be appropriately modeled.

Required:

(a) **Briefly discuss the following three terms as used in the Kagobi University registrar's office database management system:**

i. Entities (2 Marks)

ii. Attributes (2 Marks)

(b) **Explain three main methods of file organization.** (6 Marks)

(c) **Outline eight benefits of the Kagobi University registrar's office database management system**. (8 Marks)

(d) **Explain Not only SQL Database**. (2 Marks)

(Total: 20 Marks)

QUESTION THREE

Kigali Tech, a business intelligence services and solutions company in Rwanda help customers to provide a robust data warehousing environment according to their business needs. Their Business Intelligence (BI) developers and implementation experts are very knowledgeable and have great expertise in set up a data warehousing solution that can meet customer business needs and decision-making easier. They provide Business Intelligence Development and Implementation Services Using open-source technologies such as Pentaho, MongoDB, and Hadoop. Their business intelligence development services and solutions also cover other services including hardware consulting, suggesting a stack of technologies, setting up ETL and data cleaning processes, Delivering Relational Online Analytical Processing systems, and Implementation of a data warehouse. Kigali Tech uses this stack of technologies to build a data warehouse system. The majority of Kigali Tech business intelligence services and solutions in Rwanda users depend on predefined reports.

Required:

(a) **Outline three business intelligence purposes at the different management levels.**
(6 Marks)

(b) **Describe four stages in the decision-making process and how each can be supported by information systems.** (8 Marks)

(c) Business Intelligence is used for different purposes. **Explain three purposes of Business Intelligence.** (6 Marks)

(Total: 20 Marks)

QUESTION FOUR

A computer network consists of two or more computers connected to each other by a cable that allows them to share data. It is a combination of computer hardware, cabling, network devices, and computer software used together to allow computers to communicate with each other. Most networks contain a hub or switch acting as a connection device between the computers or other devices on the network.

Required:

(a) Distinguish between a hub and a switch. (4 Marks)

(b) Outline three key digital networking technologies on which contemporary digital networks and the Internet are based. (6 Marks)

(c) Describe three main types of network topologies. (6 Marks)

(d) Explain two types of physical transmission media to carry messages from one device to another. (4 Marks)

(Total: 20 Marks)

QUESTION FIVE

Consider the following required functionality of a print-on-demand service:

The print-on-demand service provides customers the possibility to print posters, flyers, or books on demand. The customer should be able to select a type of product (poster, flyer, or book), the desired quantity, and a paper type. In case a book has to be printed, additionally, the customer can choose between hard cover and soft cover. Finally, the customer needs to provide a PDF file containing the desired content. In order for the customer to be able to place an order, he or she must have an account. The customer can create an account by choosing a username/password combination. Furthermore, his or her address and credit card number can be linked to the account, which is required information when placing an order. Once a customer has provided the information for an order, the system checks if all required information is there, either given in the order (type of product, quantity, etc.), or the account (address and payment information). If any information is lacking, the system will inform the customer that it needs to be added before the order can be placed. Once all information is in place, the order is placed, and the credit card information is sent to the bank for approval. The results obtained through the processing of Big Data can lead to a wide range of insights and benefits.

Required:

(a) State six attributes of quality information useful to organizations. (6 Marks)

(b) Outline four benefits of big data. (4 Marks)

(c) Discuss five key management challenges involved in building, operating, and maintaining information systems. (10 Marks)

(Total: 20 Marks)

QUESTION SIX

The company Isheja ltd has a plan of using data from a different application to predict the rate of wind speed in the western province, but the Data scientist expert advised them to transform data from these different applications to have good mined data which is smooth. To ensure the quality of decisions taken by managers' data must be processed while in a data warehouse.

Required:

(a) **Outline the other three uses of data warehouses to the users.**   (6 Marks)

(b) **Using examples, explain four types of information obtainable from data mining.**
                                                                                      (8 Marks)

(c) **Describe three ways through which web data mining looks for patterns in data.**
                                                                                      (6 Marks)
                                                                        (Total: 20 Marks)

QUESTION SEVEN

Due to the Covid-19 pandemic affecting worldwide, many services have moved online. It is in this regard that Shema online in Rwanda nowadays provides online purchasing facilities so that guests can select goods they wish. This will include ordering, provision of purchasing facilities, and provision of secure e-commerce transactional facilities through wrapping and delivery. After a guest has entered their username and password, the user can select the name of the seller for whom the goods is being held from a keyword search facility. The system provides the user with the goods that the seller would like guests to look at. The user can view and select one or more goods by looking at the price, category, and details. After the user has placed the goods in the shopping cart the user confirms the order. At this point, a Secure Payment Gateway connection is established and the user is required to enter credit card details. After finally submitting the order, the company's inventory and payments databases are updated and the user is sent an email with an order confirmation and delivery details. Enterprise applications are systems that span functional areas, focus on carrying out business processes across the business firm, and encompass all levels of management. Enterprise applications assist businesses in becoming more flexible and productive by coordinating their business processes more closely.

Required:

(a) **Discuss two main ways in which Shema Online's information systems will enhance its business processes.**   (4 Marks)

(b) **Explain four primary types of functional information systems.**   (8 Marks)

(c) **Explain four main enterprise applications.**   (8 Marks)
                                                                        (Total: 20 Marks)

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