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**CERTIFIED PUBLIC ACCOUNTANT**  
**LEVEL 2 EXAMINATIONS**  
**F2.3: INFORMATION SYSTEMS**  
**THURSDAY: 6 JUNE 2019**

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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 are to be attempted.
3. Marks allocated to each question are shown at the end of the question.
4. Show all your workings

## QUESTION ONE

Kidasharira Extensive Orchard (KEO) located in Gisenyi province is one of the biggest orchards found in Rwanda. The orchard has got almost all the different species of apples desired by Rwandese. Many people from the other provinces are forced to board buses to get to the orchard so that they are able to pick their desired apple species.

A good number of customers approached the orchard manager and asked if they could adopt electronic business approaches like building an electronic commerce (e-commerce) website which should have the different species of apples and their prices or a mobile commerce application enabling clients with hand held devices to place their orders from wherever they are.

The customers also requested the manager to specify payment systems their e-commerce website would support.

### REQUIRED:

- (a) Explain the following terms used in the scenario:
    - (i) Mobile commerce (2 Marks)
    - (ii) Electronic commerce (2 Marks)
    - (iii) Electronic business (2 Marks)
  - (b) Explain any **four** important elements that the KEO e-commerce website should have in order for it to be successful. (8 Marks)
  - (c) Identify and explain any **three** payment systems that the customers of KEO can employ while using the proposed e-commerce website. (6 Marks)
- (Total 20 Marks)**

## QUESTION TWO

The usage of group decision support systems helps organisations to make better decisions in order to attain their organisational objectives in an efficient way. This is because any decisions in an organisation require the collaboration and participation of multiple individuals. This can be achieved by use of computer-based tools for group decision making.

The Ministry of Education in Rwanda has a number of departments where it uses group decision support systems in order to arrive at decisions with consensus. The management of the ministry provides different groups and departments with electronic meeting technologies in order to support decision making. The relationship between decision support systems and decision making is a vital concern in the field of group decision support systems (GDSS). The main goals and objective of GDSS in the ministry is to help decision makers to arrive at solutions based on the feedback from departments or more than one individual. These GDSS are composed of three main components.

A decision is acceptable when a team or group has agreed upon it. The effect of selecting a satisfactory decision affects the performance of the ministry. With the implementation of GDSS therefore, it is important to make the team or group decision making of the various departments as effective as possible.

### REQUIRED:

- (a) Define the following terms as used in the scenario above:
    - (i) A Decision terms system (2 Marks)
    - (ii) Group decision support systems (2 Marks)
    - (iii) Electronic meeting technologies (2 Marks)
  - (b) Explain the **three** main components of the GDSS used by the Ministry of Education in Rwanda. (6 Marks)
  - (c) Explain any **four** benefits the Ministry of Education in Rwanda is enjoying as a result of using GDSS. (8 Marks)
- (Total 20 Marks)**

### QUESTION THREE

Kigali Traffic Management Authority (KTMA) is a body that controls the parking of both private and government vehicles in public places like shopping malls, market areas, hospitals, offices, etc. The current parking system is semi-automated. KTMA would like to have fully automated vehicle parking systems in the city. This is because there is a continuous increase in the number of vehicles on the roads, leading to parking problems and the situation is worsening day by day where problems of traffic congestion and insufficient parking space are inevitably cropping up. The solution is to install an intelligent vehicle parking system. With this system, a human machine interface (HMI) helps in entering a unique identification number for the entry of any vehicle which helps in searching for the space where the vehicle can park until it exits.

### REQUIRED:

- (a) Define the following terms as used in the scenario above:
    - (i) Intelligent vehicle parking system. (2 Marks)
    - (ii) Human machine interface. (2 Marks)
    - (iii) Semi-automated parking system. (2 Marks)
  - (b) Explain any **three** challenges being experienced with the current vehicle packing system in Kigali. (6 Marks)
  - (c.) Explain **four** benefits that will come with the use of the intelligent vehicle packing system in Kigali. (8 Marks)
- (Total 20 Marks)**

### QUESTION FOUR

Shaka National Park, located in Southen province, is understandably Rwanda's most popular tourist attraction.

The Park's diverse ecosystem includes: sprawling savanna, sparkling lakes, humid forests and a very conducive environment for a large number of wild animals, snakes, insects and about 600 species of birds.

The information technology officer of the Park, Mr. Hageni, would like to develop an information system, Shaka National Park Information System (SNPIS), to help him manage the information about the different items of the ecosystem. He intends to use any of the various alternatives to

information system development (ISD). The different personnel who will aid in the development of the SNPIS include: system analysts, programmers, end-users, to mention but a few.

Mr. Hageni recently announced this new change in the recent meeting where it was not supported by staff claiming that working with information systems is hard.

**REQUIRED:**

- (a) Explain the following terms as used in the case study above:
    - (i) Information systems development. **(2 Marks)**
    - (ii) System analyst. **(2 Marks)**
    - (iii) Programmer. **(2 Marks)**
    - (iv) End user. **(2 Marks)**
  - (b) Explain any **three** alternative systems building approaches Mr. Hageni can use to come up with the SNPIS. **(6 Marks)**
  - (c) Explain any **three** ways in which Mr. Hageni can help his fellow staff adapt to the use of SNPIS. **(6 Marks)**
- (Total 20 Marks)**

**QUESTION FIVE**

Uterere Secondary School (USS) has used computer systems to carry out their business processes like processing students' examination results, school fees payments and keeping many other records of the school.

Last year, lightning struck the school premises. At that moment, majority of the computer power cables were plugged in the power sockets. As a result, the motherboards of all the computers whose power cables were plugged in the power sockets got burnt. This was such a setback because the school employees who were using computers whose motherboards got burnt did not know where to pick up from. This was because they had no information technology (IT) disaster recovery plan. Consequently, they lost all the vital information and hardware.

**REQUIRED:**

- (a) In reference to the scenario above, define the following:
    - (i) Computer power cable. **(2 Marks)**
    - (ii) IT disaster recovery plan. **(2 Marks)**
    - (iii) Motherboard. **(2 Marks)**
    - (iv) Hardware. **(2 Marks)**
  - (b) Explain **four** measures that should have been put in place by USS to guard against the damage that occurred to their computers and information. **(8 Marks)**
  - (c) Other than lightning, identify any other **four** threats to computer security that USS should be mindful of in future. **(4 Marks)**
- (Total 20 Marks)**

## QUESTION SIX

Comfort Zone is a famous company manufacturing mattresses in Rwanda. Established in 1980 by Ms. Mbabazi Nadege, the company first dealt in repairing mattresses. With time, it started manufacturing new mattresses and has since grown as a result of improvement in the livelihood of the people of Rwanda. More and more people are buying new mattresses and the demand has been increasing steadily. The company has since opened up 40 branches across the country. This increase in stock has made management of data and information related to inventory difficult. The senior management has engaged the services of Mr. Mwiza Jean Claude, a consultant with extensive experience in information systems, to advise them on inventory management.

Mr. Mwiza advised senior management to identify an appropriate database management system (DBMS) which can help them come up with a database to better manage their inventory. He further noted that if well implemented, a database has interesting objectives from which the company can benefit. However, the company also needs to identify the type of database to use since databases can be organised in different ways and hence take different forms. Additionally, Mr. Mwiza asserted that the company needs to be aware that the DBMS come along with different challenges.

### REQUIRED:

- (a) Explain the meaning of the following terminologies:
    - (i) Database. (2 Marks)
    - (ii) Database management system (DBMS). (2 Marks)
    - (iii) Data. (2 Marks)
  - (b) Identify any **four** types of databases and explain how Comfort Zone can use them to operate. (8 Marks)
  - (c) Explain any **three** DBMS challenges senior management of Comfort Zone might have to deal with. (6 Marks)
- (Total 20Marks)**

## QUESTION SEVEN

KLY Bank was established in 1998 by the white fathers of the Roman Catholic Church. Its mandate is to create easy access to finance and sustainable growth for the people of Rwanda.

The bank started with one branch in Kigali but now several branches have been opened in all districts across the country. Every branch maintains its own data but it has become increasingly difficult for the staff and the clients to access information.

The head of information technology (HIT) of the bank would like to lay a communication network which should connect all the branches countrywide. He is excited about the network because he knows it will come along with business benefits and, additionally, the staff will be able to use the different electronic data communication services.

However, the staff need to understand networks better. Therefore, you have been invited to make a presentation in order to educate them about communication networks.

### REQUIRED:

In your presentation:

- (a) suggest and describe the type of network which the HIT will lay to connect the different branches of the bank. **(4 Marks)**
- (b) explain **two** major requirements needed by the HIT to set up the above network. **(4 Marks)**
- (c) explain any **four** business benefits KLY Bank will derive from the communication network. **(8 Marks)**
- (d) explain any **four** electronic data communication services the staff of KLY bank will be able to use. **(4 Marks)**

**(Total 20 Marks)**



