FACULTY/COLLEGE	College of Business and Economics
SCHOOL	School of Consumer Intelligence and Information Systems
DEPARTMENT	Applied Information Systems
CAMPUS(ES)	APB
MODULE NAME	Information Systems 3B
MODULE CODE	ILS3B01
SEMESTER	First
ASSESSMENT OPPORTUNITY, MONTH AND YEAR	Supplementary Summative Assessment Opportunity January 2020

ASSESSMENT DATE	7 Jan 2020	**SESSION**	08:00 – 11:00
ASSESSOR(S)	Prof Kennedy Njenga		
MODERATOR(S)	Dr Patrick Ndayizigamiye		
DURATION	3 hours (180 min)	**TOTAL MARKS**	100

NUMBER OF PAGES OF QUESTION PAPER (Including cover page)	4

INFORMATION/INSTRUCTIONS:

- This is a closed-book assessment.
- Please answer all questions in Section A, and Section B.
- Read the questions carefully and answer only what is required.
- Number your answers clearly and correctly as per the question paper.
- Write neatly and legibly on both sides of the paper in the answer book, starting on the first page.
- The general University of Johannesburg policies, procedures and rules pertaining to written assessments apply to this assessment.

CASE STUDY

THE FOURTH INDUSTRIAL REVOLUTION (4IR) IN FARMING: A CASE OF RS COMPONENTS

By RS Components: Source https://www.polity.org.za/article/agriculture-heading-towards-4ir-2019-06-12

In South Africa, the Fourth Industrial Revolution (4IR) is beginning to be embraced and some industries have started to enjoy the benefits. The agricultural industry has for instance welcomed this technologically driven wave as the demands of consumers continue to escalate deeming the traditional methods of farming obsolete. At the recent ***NAMPO Harvest Day***, the Southern Hemisphere's largest agriculture expo, many companies have started to showcase '*smart*' tools and monitoring systems for farming. One such company, RS Components South Africa that specialises in Internet of Things (IoT), exhibited a number of products that can shift farmers closer towards the 4IR.

MD for RS Components SA, Brian Andrew, while showcasing the company's products and services said the following:

> "*NAMPO 2019 was a huge success for us as an exhibiter and I am sure the other exhibitors share our sentiments. At this year's NAMPO event, it was undeniable that agriculture is fast moving into the smart and connected age. Over the past few years we have seen the many ways that connected technologies have benefitted us from our day-to-day lives to the way we work, the way we communicate and it has revolutionised the various industry sectors as we know it. Agriculture is definitely one of the many industries that has embraced the Fourth Industrial Revolution (4IR). Now farmers can manage their yields wirelessly through connected devices and sensors that can monitor various aspects which affect and have effects on produce and livestock simultaneously. Gone are the days of using light aircrafts to crop-dust and fertilize fields, farmers are now using drones which are cheaper, sustainable and the farmer can fly the device by himself…*"

NAMPO 2019 had more than 80,000 visitors who attended this year's show in Bothaville, Free State and it has cemented itself as a popular gathering place for people involved in the agriculture industry. On his first visit to the NAMPO Harvest Day, the Deputy Minister of Agriculture, Forestry and Fisheries, Sfiso Buthelezi, described it as the best-kept secret of the agricultural sector that should be experienced by everybody in South Africa who consumes food.

According to Professor Louis Fourie from the Cape Peninsula University of Technology (CPUT), the Internet of Things (IoT) and technologies such as Artificial Intelligence (AI) farm management systems, big data analysis and robotics have revolutionised agriculture. He states the following:

> *"This has resulted in efficient and sustainable ways of farming, higher yields, superior quality products, cost reductions and even the enhancement of food's*

nutritional value. Several disruptive technologies in the fields of biotechnology, nanotechnology, genetics and autonomous vehicles play a significant role in the digital transformation of agriculture. Smart farming, including precision farming, often incorporates technologies such as geographic information systems, GPS, remote sensing technologies, AI, robotics, the IoT and big data."

Professor Louis also added that based on an analysis of the soil, animals and the weather, smart farming contemplates the individual needs of a plant or animal to optimise yield. He states:

"*Real-time data input from sensors are increasingly allowing AI systems (with machine-learning capabilities) to process big data, evaluate situations and make autonomous decisions to improve efficiency. Smart farming leans heavily on sensor technology that detects events or changes in the environment and sends information in real-time to other devices within the ecosystem. It is used to collect data on soil moisture, soil nutrients, water levels, crop and animal health, as well as climatic, environmental, and growth information through the integration of different kinds of agricultural devices and equipment, Unmanned Aerial Vehicles (UAVs) and even satellites*,"

Agriculture is still one of the main economic driving forces in the country. The adoption of technology in agriculture also requires that various stakeholders work together. And while agricultural technology will result in higher yields, reduced costs and improved nutritional value of foods, it needs the farming sector, business, government and education institutions to work together.

SECTION A [CASE STUDY] [50 MARKS]

Question 1

Describe emerging trends/technologies that will impact the changing Internet and influence farming companies such as RS Components South Africa.

(10)

Question 2

According to the above case, "*agriculture is definitely one of the many industries that has embraced the Fourth Industrial Revolution (4IR)".* What are the most important considerations for a farmer wanting to embrace 4IR?

(10)

Question 3

Compare and contrast decision support systems and geographic information systems that would be used in agriculture.

(15)

Question 4

Define the 5 major types of data-mining tools that could be used by RS Components South Africa which specialises in Internet of Things (IoT).

(15)

SECTION B [GENERAL QUESTIONS] [50 MARKS]

Question 5

Describe the outsourcing environment and how outsourcing works.

(15)

Question 6

Describe the purpose of Goal Seek in spreadsheets such as MS Excel.

(10)

Question 7

Describe business continuity planning (BCP) and illustrate its six phases.

(18)

Question 8

Identify the seven types of hackers and explain what motivates each group.

(7)