



<b><u>FACULTY</u></b>	: Education
<b><u>DEPARTMENT</u></b>	: Childhood Education
<b><u>CAMPUS</u></b>	: SWC
<b><u>MODULE</u></b>	: SATINA1 Introduction to Science and Technology for the Intermediate Phase1
<b><u>SEMESTER</u></b>	: First
<b><u>EXAM</u></b>	: May main examination 2019

<b><u>DATE</u></b>	: 22 May 2019	<b><u>SESSION</u></b>	: 08h30
<b><u>ASSESSOR(S)</u></b>	: Dr. M.M. Kazeni (UJ)		
<b><u>MODERATOR</u></b>	: Mr. E. Libusha (UJ)		
<b><u>DURATION</u></b>	: 2 HOURS	<b><u>MARKS</u></b>	: 100

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NUMBER OF PAGES: 4 PAGES

INSTRUCTIONS:

1. Answer ALL THE QUESTIONS.
  2. Number your answers clearly
  3. Answer ALL questions in the same exam booklet.
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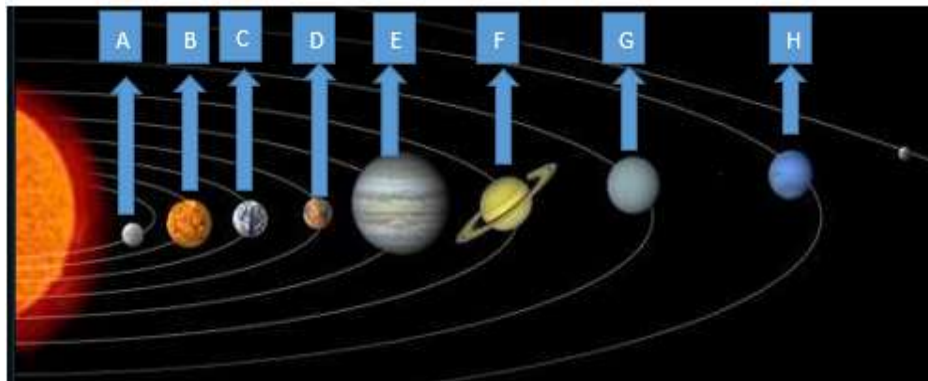
### QUESTION 1: THE NATURE AND PROCESSES OF SCIENCE [15]

- 1.1 Otuka (1983) defined science as, “*Man's attempt to understand his environment*”. Provide one shortcoming of this definition of science. (1)
- 1.2 One of the characteristics of science is that, “*Science is a human endeavour, and it is socially and collaboratively constructed*”. Explain the meaning of this statement. (4)
- 1.3 Distinguish between basic and integrated science process skills and provide an example of each, to substantiate your answer. (4)
- 1.4 During a scientific investigation, an investigator should identify the independent, dependent and intervening variables. Define:
  - 1.4.1 Independent variables (2)
  - 1.4.2 Dependent variables (2)
  - 1.4.3 Intervening variables (2)

### QUESTION 2: OUR SOLAR SYSTEM

[15]

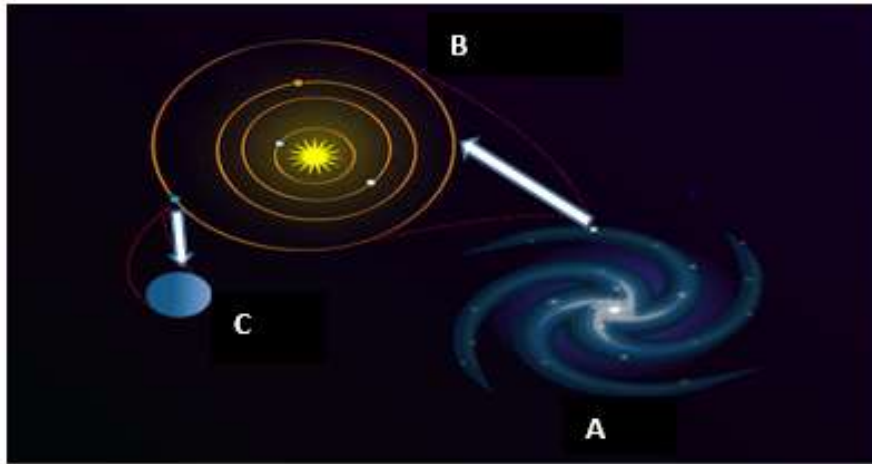
- 2.1 The diagram below represents our solar system. Name the planets labelled A to H. (8)



- 2.2 In 2015, NASA placed an advert for people to travel to planet Mars.
  - 2.2.1 State three (3) similarities between planet Earth and planet Mars. (3)
  - 2.2.2 Provide four (4) disadvantages of living on Mars. (4)

### QUESTION 3: THE UNIVERSE [18]

- 3.1 Discuss the evidence that supports the ‘Big Bang’ theory as a viable explanation of the beginning of the universe. (1/2 page) (12)
- 3.2 Explain the Christian interpretation of the ‘Big Bang’ theory (3)
- 3.3 The following figure shows some bodies found in space. Name the bodies labelled; A, B and C. (3)

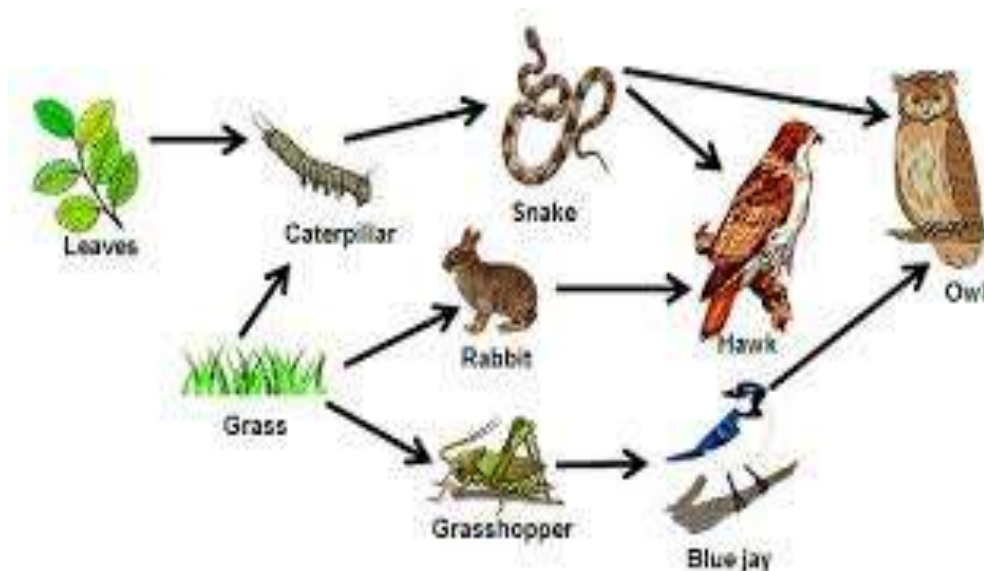


#### QUESTION 4: ORIGIN AND CHARACTERISTICS OF LIFE [16]

- 4.1 The origin of life has fascinated the human mind from time immemorial. Scientists have proposed several theories, including the 'Electric spark theory', which attempt to explain the emergence of life.
- 4.1.1 Describe the 'Electric spark' theory of the origin of life. (3)
- 4.1.2 Discuss the evidence that support this theory. (¼ of a page) (5)
- 4.2 According to the 'origin of life' theorists, life on earth started from reactions of atoms, which later developed into complex organisms. With the help of a diagram, provide the hierarchy of life, starting from an atom to the complex organism. (8)

#### QUESTION 5: INTERACTIONS AMONG LIVING THINGS [26]

The following diagram shows a food web in an ecosystem. Study the diagram and answer the following questions.



- 5.1 Identify one organism in the food web which is a:
- 5.1.1 Producer (1)
  - 5.1.2 Primary consumer (1)
  - 5.1.3 Secondary consumer (1)
  - 5.1.4 Tertiary consumer (1)
  - 5.1.5 Herbivore (1)
- 5.2 The processes of photosynthesis and respiration are known to sustain life on Earth. Explain the following:
- 5.2.1 The process of photosynthesis (5)
  - 5.2.2 The process of respiration (5)
  - 5.2.3 How photosynthesis and respiration sustain life on earth. (5)
- 5.3 The two pictures below show two symbiotic relationships A and B.



A. Bird on an elephant



B. Aphids on a cherry tree

Name and describe the type of relationship shown in:

- 5.3.1 Picture A. (3)
- 5.3.2 Picture B. (3)

## QUESTION 6: EVOLUTION OF LIFE [10]

Darwin's theory of evolution states that *"All species of organisms arise and develop through the natural selection of small, inherited variations that increase the individual's ability to compete, survive, and reproduce"*.

Discuss the concept of **artificial selection** and explain how it can be used to support the theory of evolution through natural selection. (1/2 a page) (10)

**TOTAL MARKS: [100]**

**THE END**