



THE UNIVERSITY OF TRINIDAD & TOBAGO

FINAL ASSESSMENT/EXAMINATIONS SEPTEMBER 2014

Course Code and Title: SCIE 4001- Earth and Life Sciences 11

Programme: Bachelor of Education

Date and Time: [Please insert in accordance to the timetable]

Duration: 3 hours

PLEASE READ ALL INSTRUCTIONS CAREFULLY BEFORE YOU BEGIN THIS EXAMINATION

Instructions to Candidates

1. This paper has 14 pages with 25 multiple choice and 6 short answer questions. There are 4 Sections (A, B, C and D).
2. Section A – Multiple Choice, comprises TWENTY FIVE (25) questions. Candidates are required to answer ALL questions in this Section.
3. Students are required to answer three questions. - one question from each of the following Sections B, C and D. All questions carry equal marks.
4. You must return the question paper along with your answer booklet and other writing paper to the Invigilator at the end of the examination.

Key Examination Protocol

1. Students please note that academic dishonesty (or cheating) includes but is not limited to plagiarism, collusion, falsification, replication, taking unauthorised notes or devices into an examination, obtaining an unauthorised copy of the examination paper, communicating or trying to communicate with another candidate during the examination, and being a party to impersonation in relation to an examination.
2. The above mentioned and any other actions which compromise the integrity of the academic evaluation process will be fully investigated and addressed in accordance with UTT's academic regulations.
3. Please be reminded that speaking without the Invigilator's permission is **NOT** allowed.

SECTION A
25 marks

MULTIPLE CHOICE QUESTIONS

*This Section contains twenty five (25) multiple choice questions, students are required to answer **all** the questions on the answer sheet provided. Candidates must indicate one (1) response per question by shading or circling the appropriate letter on the answer sheet. Changes to your response must be made by drawing a line through the answer to be changed and initialing next to the changed response.*

1. Which of the following forms of energy is released or absorbed in most chemical reactions?
 - (A) Light energy
 - (B) Electrical energy
 - (C) Sound energy
 - (D) Heat energy.

2. What happens when a sample of water turns into ice?
 - (A) New molecules are formed
 - (B) The mass of the sample is increased
 - (C) The arrangement of the molecules changes
 - (D) Energy is absorbed by the molecules

3. A student divides several cubes into two groups based on whether or not each cube can float in water. What property is the student using to classify the cubes?
 - (A) Weight
 - (B) Density
 - (C) Conductivity
 - (D) Mass

4. Which class of elements best conducts electricity?
 - (A) Metals
 - (B) Non metals
 - (C) Semi metals
 - (D) Noble (inert) gas

5. Within a substance atoms that collide frequently and move independently of one another are most likely in a
 - (A) Liquid
 - (B) Solid
 - (C) Gas
 - (D) Crystal

6. Which of the following is NOT a feature of the image formed by a plane mirror?
 - (A) Same size as the object
 - (B) Same distance behind the mirror as the object is in front of it
 - (C) Upside down but same size as the object
 - (D) Upright and same size as the object

7. Which of the following suggests that matter is made up of particles in continuous motion?
- (A) Water boils at 100 degrees Celsius
 - (B) Iron rusts when exposed to air and water
 - (C) Methane burns in oxygen to produce gases
 - (D) We can smell the perfume of a lady walking past
8. Which one of the following statements about the kinetic theory of matter is **NOT** correct?
- (A) Matter is made up of particles called atoms and molecules
 - (B) Changes in the states of matter are due to changes in the motion of particles
 - (C) The higher the temperature the faster the particles move.
 - (D) In going from solid to liquid to gas, the motion of molecules decreases and the forces of attraction between them increase.
9. An example of a wheel and axle is:
- (A) The garden fork
 - (B) The inclined plane
 - (C) The pulley
 - (D) The bicycle
10. When the temperature of a liquid is decreased, the particles slow down, the attractive forces between them become stronger and stronger until their positions become fixed. This change in the arrangement and motion of particles is referred to as:
- (A) Melting
 - (B) Freezing
 - (C) Condensing
 - (D) Boiling

11. Mary-Ann is investigating how the thickness of a rubber band affects the pitch of the sound when plucked. The manipulated variable is:

- (A) Thickness of the rubber band
- (B) Tension on the rubber band
- (C) Length of the rubber band
- (D) Material used to make the rubber band

12. Four objects were left out in the sunlight for the same duration of time (hours).

Which object will feel hottest to the touch?

- (A) A wooden chair
- (B) A large glass mirror
- (C) An iron pot
- (D) A styrotex ice cooler

13. A student lowers one end of his pencil in a glass of water and to his amazement he observes that it looks bent. Which statement below best explains the behavior of light waves that accounts for the student's observation?

- (A) Some materials absorb light waves of certain frequencies.
- (B) Some materials reflect some of the waves and absorb some.
- (C) Light waves change direction when they meet a new medium
- (D) Light waves are emitted by some material.

14. While working on his electricity project, a student realizes that he must increase the magnitude of the current in the circuit to make his bulb light brighter. If he is not allowed to add batteries or change batteries, which of the following might help?

- (A) Use uninsulated thicker wires
- (B) Use longer thinner wires
- (C) Use longer thicker wires
- (D) Use shorter thicker wires

15. A student stands 2 metres in front of a plane mirror and observes an image of himself inside the mirror. He steps backwards by 1 metre. How far away from where he now stands is the image located?

- (A) 6 metres
- (B) 2 metres
- (C) 3 metres
- (D) 5 metres

16. An example of a lever is:

- (A) The hammer
- (B) The see-saw
- (C) A scissors
- (D) All of the above

17. Examples of inclined planes are:

- (A) Gliders and rocket
- (B) Ramps and wedges
- (C) Wheels and axle
- (D) All of the above

18. Technology is

- (A) Static in nature
- (B) Cyclical in process
- (C) Opposed to scientific fact
- (D) Curiosity

19. A knife is an example of

- (A) An Inclined Plane
- (B) A Wedge
- (C) Ramp
- (D) Pulley

20. Which of the following contributes to making a mercury in glass thermometer quick acting?

- (A) The long glass stem
- (B) The narrow capillary tube
- (C) The color of mercury
- (D) The shape of the bulb

21. Which of the following processes does NOT require a medium for heat transfer?

- (A) Conduction
- (B) Convection
- (C) Radiation
- (D) Evaporation

22. Temporary hardness of water can be removed by

- (A) Ion-exchange method
- (B) Boiling
- (C) Addition of aluminum
- (D) Addition of scum

23.

Object	Density g/cm ³	Mass g	Volume cm ³
i		4	2
ii	8		4
iii	2	1	
iv		2	4

Fig 1: Table of objects and their densities

The object with the greatest mass will be:

- A. i
- B. ii
- C. iii
- D. iv

24. From Fig. 1 above, the objects which could be made of the same substances could be?

- A. i & ii
- B. ii & iv
- C. iii & iv
- D. i & iii

25. From Fig 1 above, an object which would float in water would be:

- A. i
- B. ii
- C. iii
- D. iv

END OF THE MULTIPLE CHOICE SECTION

SECTION B

This section consists of TWO (2) questions.

**Candidates are required to answer ONE (1) question from this section
ALL questions carry equal marks**

Question 1

1a. Use the kinetic theory of matter to explain the following observations;

- (i) The air in a car tyre exerts pressure on the walls of the tyre. 5mks
- (ii) The pressure inside the tyre increases when the tyre is pumped up.
5mks

1b. Describe briefly how the particles/molecules are arranged in each of the three states/phases of matter. 5mks

1c. A firm is going to sell a new aftershave called 'Macho' . Men use aftershave because they say as it evaporates from their skin it makes them feel cooler (fresher) and also it can be smelled some distance away. Explain (a) how you think evaporation of the aftershave results in cooling and (b) It can be smelled some distance away. 10mks

Question 2

Define energy so a primary school student can understand its meaning.
Identify three types of energy and state their sources.

8 mks

Distinguish renewable from non-renewable sources of energy

5mks

Compare the advantages and disadvantages of each type of energy .

5mks

Illustrate the energy conversions which are taking place to bring electricity from the oil fields to our homes in Trinidad and Tobago.

7mks

SECTION C

This section consists of TWO (2) questions

Candidates are required to answer ONE (1) question from this section

ALL questions carry equal marks

Question 3

3a. Uncle George and Freddie Jones would like to play see-saw. Uncle George weighs 800 Newtons and Freddie Jones weighs 400 Newtons. Explain with the aid of a diagram and vectors (arrows) to represent their weights, how they will balance on the see saw. 10 mks

3b. Each one of them would like to sit at an end of the see-saw. Explain with the aid of a vector diagram how the see-saw must be adjusted so they will balance. 9mks

3c. If the moon is $\frac{1}{6}$ the mass of the earth, what would happen to the mass of Uncle George on the moon? What would happen to the weight of Uncle George on the moon? Explain your answer. 6 mks

Question 4

- 4a. Define the terms *Force, Work*. 6mks
- 4b. Provide examples of any **two** of the following in your home:
- (i) lever (ii) wheel and axle (iii) Inclined plane 4mks
- 4c. With the aid of diagrams explain the scientific principle on which they(two machines in 4b) function to make work easier. 10 mks
- 4d. Explain why simple machines are not 100% efficient? 5mks

SECTION D

This section consists of TWO (2) questions.

Candidates are required to answer ONE (1) question from this section

ALL questions carry equal marks.

Question 5

(a) You have been asked by the science department to design a toy for teaching purposes. Illustrate how you will go about achieving this task through your knowledge of the technological processes? **10 mks**

~~5~~ mks

(b). What is meant by the centre-of- gravity of an object? Explain why a coin is more stable lying on its side than standing up on its edge?

~~6~~ mks **7 mks**

(c) The form or structure of objects enables them to perform essential functions. Explain this statement using two appropriate examples. ~~4~~ mks **8 mks**

Question 6

- a. A bee has an acidic sting; a wasp has an alkaline sting. What household substance would you use to treat the effects of their stings. **4 mks**
- b. Explain the scientific principle underlying your choice, and illustrate the principle using a word equation. **6 mks**
- c. What substance(s) is /are responsible for the hardness of water in a community's water supply, and how do these substances enter the water supply? **5 mks**

(a) What are some of the effects of hard water and describe two ways of making water soft. 10mks

END OF EXAMINATION