



THE UNIVERSITY OF TRINIDAD & TOBAGO

JULY, 2014 EXAMINATIONS

Course Code and Title: SCIE 4001 Science111: Earth and Life Sciences-Part 11

Programme: Bachelor of Education

Date and Time:

Duration: 2 ½ Hours

PLEASE READ ALL INSTRUCTIONS CAREFULLY BEFORE YOU BEGIN THIS EXAMINATION

Instructions to Candidates

1. This paper has 4 Sections (A, B, C and D).
2. **Section A – Multiple Choice, comprises of TWENTY FIVE (25) questions. Candidates are required to answer ALL questions on the sheet provided.**
3. Students are required to answer THREE (3) questions from Sections B, C and D.
4. **Section B** consists of TWO (2) questions. Candidates are required to answer **ONE** question from this Section.
5. **Section C** consists of TWO (2) questions. Candidates are required to answer **ONE** question from this Section.
6. **Section D** consists of TWO (2) questions. Candidates are required to answer **ONE** question from this Section.
7. **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 regulation
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 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 class of elements best conducts electricity?
 - (A) Metals
 - (B) Non metals
 - (C) Semi metals
 - (D) Noble (inert) gas

2. 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

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

22. Temporary hardness of water can be removed by

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

23. All of the following statements are correct **except**

- (A). Liquids of lower densities float in liquids of higher densities
- (B). The density of a substance is its mass per unit volume
- C). Substances become denser when they are hotter
- (D). The mass of a substance cannot be changed by the location and shape of the substance

24. Two observable effects that a force can have on a body are to change its

- (A) Temperature and size only
- (B) Size and motion

- (C) Motion and colour
 - (D) Size and colour
25. When an acid is added to a base it produces a
- (A) Salt only
 - (B) Salt and water only
 - (C) Salt and gas only
 - (D) Gas and water only

SECTION B - ENERGY

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

- (a) A little boy wanted to throw a 5cents into a pool for good luck but he mistakenly threw his 25 cents for candy into the pool! The boy fell into the pool while he tried to retrieve his money for candy. Using ray diagrams, explain why the pool appeared shallower. (4marks)
- (b) Explain the energy changes taking place in the following situations:
- (i) Two children playing seesaw

- (ii) A man playing a guitar (3 marks)
- (c) With the aid of diagrams, explain the difference between light bulbs connected in series and light bulbs connected in parallel. (6 marks)
- (d) What advantage is there in connecting light bulbs in parallel?
(2marks)

Question 2

- (a) A gas tap is turned on for a few seconds, someone a couple of meters away hears the gas escaping long before she smells it. What does this indicate about the speed of sound and the motion of molecules in the sound- carrying medium? (3 marks)
- (b) Explain why the metal lid of a jam jar can be unscrewed easily if the jar is inverted for a short time while in warm water. (2marks)
- (c) With the aid of a diagram describe what you will observe after you put a pot of water on the cooker before you start seeing bubbles. (5marks)
- (d) You have been given three steel needles X, Y and Z. Two of them are magnetized while the third one is not. Describe how you will identify them if no other apparatus is available. (5marks)

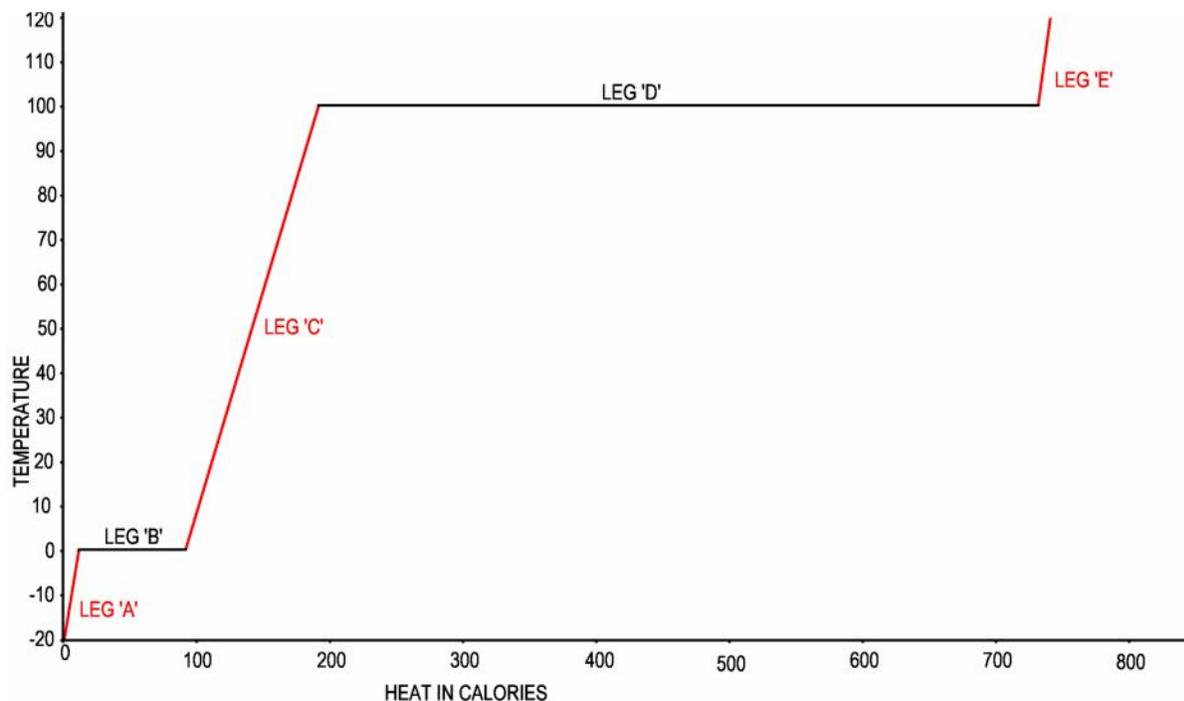
SECTION C- MATTER AND MATERIALS

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



(a) The above diagram represents the heat curve when ice is heated from -20 degrees Celsius to 120 degrees Celsius.

In a journey up the phase change pathway describe fully what takes place in **Leg B and Leg C** of the journey. (4marks)

(b) It is Mary's birthday party. Everybody was served orange juice which her mother prepared by using koolaid sachets. Jane added more sugar to her drink because she felt that it was not sweet enough! She stirred her drink with the spoon but found out that the juice was now too sweet and she could see the sugar remaining in her glass.

(i) With the aid of diagrams, explain fully what happened to the juice from the moment it was prepared using the sachet. (4 marks)

(ii) How will you describe Jane's drink? (3marks)

(c) Using Sodium bicarbonate alone will not make your cake batter to rise properly! What do you have to add to your batter to make it rise properly and why? Explain this reaction fully (4 marks)

Question 4

(a) Mr. Smith was given some cough mixture to take. On it was written "shake before consumption"

- (i) Why do you think he must shake the mixture before taking it? (2marks)
- (ii) Write down two (2) differences between the two mixtures that make the cough mixture a suspension and the sugar mixture a solution. (4 marks)
- (iii) Use word equations to explain the action of soap on hard water. (3marks)

Density of Some substances	
Substances	Density (g/cm³)
Rubbing alcohol	0.79
Glycerin	1.26
Corn Oil	0.93
Water	1.00
Wood	0.85
Aluminum	2.70
Rubber	1.34
Plastic	1.17
Cork	0.25

(b) Study the table above. Use the information from the table to answer the following questions:

- (i) Which liquid could be used to distinguish between cork and wood?
(2 marks)
- (ii) Which liquid could be used to distinguish between rubber and plastic?
(2 marks)

- (iii) Which two liquids if mixed together can be separated by fractional distillation? Give a reason for your answer. (3 marks)

SECTION D

STRUCTURE AND MECHANISMS

This section consists of TWO (2) questions.

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

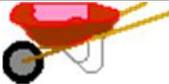
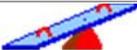
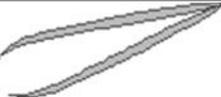
ALL questions carry equal marks.

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? (5 marks)
- (b) Using sketches, illustrate three different types of levers and label the fulcrum, the load and the effort. (6marks)
- (c) The form or structure of objects enables them to perform essential functions. Explain this statement using two appropriate examples. (4marks)

Question 6

- (a) Science and technology are interdependent but different. Discuss this statement. (5 marks)
- (b) An engineer needs to know the MASS of a steel girder which is 15 meters long, 0.1 meter wide and 0.1 meter high.
If the density of the steel is = 8000kg/m^3 what is the mass of the steel? (4marks)

ITEM	LEVER	CLASS
stapler		
bottle opener		
wheelbarrow		
nail clippers		
nut cracker		
see-saw		
hammer's claws		
scissors		
pliers		
fishing rod		
tweezers		
tongs		

Identify the type of Lever Class in the above table.

(6marks)

END OF EXAMINATION