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**Centre for Open and Lifelong Learning**

# **FEEDBACK TUTORIAL LETTER**

## **1<sup>st</sup> SEMESTER 2020**

### **ASSIGNMENT 1**

#### **Basic Science** **BSC410S**

## Dear Student

Assignment One has been marked and this serves as feedback on the assignment. Individual feedback is already included in your assignments by the marker tutors that marked your assignment. We hope that the answers contained in this feedback letter will guide you through finding the correct solutions more easily.

The course Basic Science consists of three sections, Biology, Chemistry and Physics. These three “legs” of science are intertwined on so many levels and understanding how, rests on many facts and rules. The feedback tutorial letter explains every question and gives the correct answer, as well as elaborate on how to arrive at the correct answer. Study the solutions carefully. If there are still areas that are unclear, please contact the tutors.

I would like to address copying and pasting answers from sources:

Referencing is used to inform the reader of a piece of work (in this case your assignments) where ideas from other sources have been used in said piece of work.

When you present an answer, you are presenting it as your own work. But if it is exactly the same words and in the same order it is not your work. Exact words, written or spoken, must be placed in quotation marks, as well as referencing the source.

Facts and common knowledge from a variety of sources do not need to be acknowledged. However, common knowledge and facts varies across subject fields.

The idea of assignments is not to copy and paste from other sources. It is to do research on the topics and come up with the answers IN YOUR OWN WORDS. That will also be an indication that you have put in effort and have worked towards understanding the work.

We would also like to bring under your attention a few tips on answering questions in future assignments and the examination in Basic Science:

- Make sure you read the question carefully. Make sure you read the WHOLE question.
- Try to not leave out any questions. You have enough time to answer all the questions. If you do not understand a question, ASK. Leaving out answers without any attempt costs a lot of marks.
- Make sure you understand what is asked.
- Discuss, relate, explain, estimate, calculate, determine, describe, verify, list; these are all words that have different meanings. Make sure your answer answers the question.
- We have found that some of your answers are unnecessarily long. Keep your answers to the point. Also observe the MARK ALLOCATION in order to decide how many facts to include in your answer.
- Double check your answers.
- Please use a dictionary, at this stage there is no excuse for spelling mistakes.
- You are now submitting your assignments online through TURNITIN, an internet-based plagiarism detection service. Thus, your assignments are cross-checked for any plagiarism. Therefore, it is imperative that you write your answers in your own words and not copy directly from any source.

## Section A – Biology [40]

### QUESTION 1

[17]

- 1.1.1 Sensitivity enables the organism to respond and react to the environment
- 1.1.2 Reproduction ensure continuity in generation of the species and prevents extinction
- it is not enough to just state what reproduction is as it does not explain what the importance is
- 1.1.3 Excretion enables the organisms to get rid of unwanted, excess and toxic waste from the body
- 1.2 Flagella – tail like structures that whips around to propel the microorganism (bacteria)  
Cilia – miniature flagella that helps the microorganisms (bacterium) to swim
- make sure you also mention how each mechanism makes the bacteria move
- 1.3 It is made up of two parts namely Genus and Species  
First name is genus, with first letter being a capital. Second name is species, with no capitals.  
Italics are used when the name is printed. The name is underlined if it is handwritten.
- 1.4 Any correct four (4)  
Scientific names are universal  
Scientific names provide more information  
Common names are localised  
Common names don't provide more information  
Common names differ from place to place hence can cause confusion

### Question 2

[13]

- 2.1 Like animals, protozoans: ( any correct 2)  
Have no cell walls  
Have no chlorophyll so they are consumers.  
Most can move (locomotion)
- Like plants, algae:  
Have chlorophyll, hence are producers  
Many leave as single cells or form long chains
- 2.2 - Viruses do not possess all the seven characteristics of living organisms  
- Viruses can only reproduce inside the host cell, they cannot reproduce independently.
- 2.3 Any correct three (3)  
Ecologically, conifers contribute food and shelter to animals and other organisms, and their roots hold the soil in place and help prevent soil erosion.  
Used for wood, paper, furniture, etc.  
Ornamental plants (trees, landscaping, Certain conifers provide Christmas trees)  
Food – pine nuts (pesto, etc.)  
In South Africa pine are planted for timber.

- 2.4.1 Tuberoses are monocots because the flower parts are in multiples of 3  
2.4.2 Periwinkle is a dicot because the flower parts are 5
- what can you see on the pictures? You cannot list what you cannot see

### Question 3

[10]

- 3.1.1 - Grass (producer)  
- Mushroom (decomposers)
- 3.1.2 - The species that depended on the snakes will have to find alternative source of food, move away or starve to death.
- The species on which the snakes depended will now increase uncontrollably in numbers, finish their food fast and will also die eventually. As the snakes helped to keep their population in control.
- Do not just give generic answers, you have to refer to the specific organisms in the food chain you can see
- 3.2 Any correct two (2)
- Loss of habitat (deforestation, wildfires, environmental clearing etc)
  - Overexploitation (poaching, trophy hunting, over harvesting of certain marine species e.g. pilchard)
  - Chemical poisoning/pollution
  - Climate change
- 3.3 - Parasitism is the situation whereby one organism benefits while the other organism is being hurt  
- Commensalism is the situation whereby one organism benefits while the other organism is not hurt

## Section B – Chemistry [40]

### QUESTION 4

[20]

- 4.1.1 Reactants are starting substances in a chemical reaction.  
4.1.2 Products are substances which are produced in a chemical reaction.
- 4.2.1 Condensation  
4.2.2 Reverse sublimation or deposition  
4.2.3 Sublimation  
4.2.4 Evaporation or boiling
- 4.3.1 Simple distillation is used to separate a pure solvent from a solution  
4.3.2 used to separate one liquid from a mixture of liquids that have different boiling points  
4.3.3 Evaporation is used to separate a solute from a solution
- 4.4 Ice particles are packed closely together, resulting in its hard, fixed state thus move through vibration only  
whereas particles in water move rapidly enough to slide over one another i.e. ability to flow.
- Remember that your answer has to fit the question

- 4.5 Chemical change because during combustion a substance is converted into a new or different substance.
- 4.6 Water is a solvent; salt is a solute and seawater is a solution.
  - make sure you refer to what is in seawater
- 4.7 Compound because it made up of two elements namely carbon and oxygen.
- 4.8 Sodium chloride is a white, unreactive solid compound that adds flavour to food whereas chlorine is a poisonous, pale, green gas and sodium is a highly reactive metal.

### QUESTION 5

[20]

- 5.1 Length is the distance between two objects.
  - read the whole question, it is not about physical quantity, but about length

$$\begin{array}{ll}
 5.2.1 & \text{°C} = (\text{°F} - 32) / 1.8 & \text{K} = 273.15 + \text{°C} \\
 & = (212 - 32) / 1.8 & = 273.15 + 100 \\
 & = 100 \text{ °C} & = 373 \text{ K}
 \end{array}$$

$$\begin{array}{ll}
 5.2.2 & \text{°F} = (1.8 \times \text{°C}) + 32 & \text{K} = 273.15 + (-95) \\
 & = (1.8 \times -95) + 32 & = 273.15 - 95 \\
 & = -139 \text{ °F} & = 178 \text{ K}
 \end{array}$$

5.3.1 Balance scale

5.3.2 Spring balance (you have to be specific in the type of scale/balance in 5.3.1 and 5.3.2)

5.3.3 Thermometer

5.4.1 300 m

5.4.2 50 m

5.5.1  $1.25 \times 10^{-2}$

5.5.2  $1.25 \times 10^2$

5.6.1 4

5.6.2 2

5.6.3 5

5.7.1 0.00022 cm

5.7.2 301.2 mL

5.8.1 2.26

5.8.2  $6.67 \times 10^{12}$

5.8.3 351.4

Section C – Physics [30]

QUESTION 6

[10]

6.1.1 x – axis = months  
y- axis = amount/number/quantity

6.1.2 x – axis = months  
y- axis = number/quantity

6.2 6.2.2 is better  
The graph has a title  
The graph has axis titles  
Small intervals on the y-axis to take easy readings

- ask yourself which graph you can take easier and more accurate readings from and why?

6.3  $food = \frac{500 - 350}{1} = 150$

$$drinks = \frac{450 - 150}{1} = 300$$

QUESTION 7

[10]

7.1 renewable – can be replenished when used up  
non-renewable – cannot be replenished once it is used up

- be careful to say use over and over, re-usable is something like plastic, to replenish mean if you chop down a tree to use for fuel you have to plant a new one to have wood again

7.2.1 non-renewable

7.2.2 renewable

7.2.3 non-renewable

7.3 any three (one mark each)

walk or use bicycle or public transport not car  
recycle and re-use instead of buying new every time  
buildings with better insulation will reduce the use of fuel burning heaters  
buildings with better ventilation will reduce the use of air conditioners

7.4 any two (one mark each)

chemical to heat (when burning fuel to heating/boiling the water in stage one)

heat to kinetic/movement (when the steam turns the turbines)

kinetic/movement to electrical (when the rotating turbines generate elec energy)

- make sure you mention the process and the energy conversion

**QUESTION 8**

**[10]**

8.1 parallel resistance:  $\frac{1}{R_{parallel}} = \frac{1}{3} + \frac{1}{6} = \frac{3}{6}$  (use the correct formula)

thus the parallel resistance =  $\frac{6}{3} \Omega = 2$  (remember to invert your answer of the above formula)

total resistance for the circuit = 4 + parallel resistance  
= 4 + 2  
= 6  $\Omega$

8.2 Determine the total current in the circuit. (2)

8.2  $I = \frac{V}{R}$                        $I = \frac{12}{6}$                        $I = 2A$

8.3 Determine the voltage across the 4  $\Omega$  resistor. (2)

8.3  $V = IR$                        $V = 2 \times 4$                        $V = 8V$

- if your answer for 8.2 is incorrect, the answer for 8.3 is marked with the error

8.4 PD = potential difference  
It is lower due to internal resistance of battery/cell/power supply