



TOM NEWBY SCHOOL EXAMINATION



Subject	Natural Sciences	Examiner	Mrs M. Fourie and Mr M. Hudson
Date	14 November 2016	Total marks	70
Session	1	Duration	2 hours
Grade	7	Moderator	Mrs M. Fourie and Mr Hudson
Special instructions/ Equipment	Use rulers and pencils or colouring pencils for drawings/ graphs.		

NAME: **MEMORANDUM**

GRADE: 7 _____

This Exam has been compiled using notes and information contained in the Tom Newby School book. The marking memorandum has been compiled accordingly. While alternative responses will be given due acknowledgement, the official memorandum will be considered a priority document to ensure uniformity of marking. Time allocation on this examination includes provision for concession.

INSTRUCTIONS:

1. Answer all questions on the A-4 lined paper provided.
2. Read all the questions carefully before you start writing.
3. Rule off after each question/ section.
4. Look carefully at the mark allocation.
5. Set out your work very neatly.
6. Think before you INK! Do your best and good luck.

SECTION A – QUESTION 1- MULTIPLE CHOICE

(10)

Read each statement carefully. Choose the correct answers from the options provided and write down only the number and your answer, e.g. 1 c

1. The main source of electricity in South Africa is...
 - a) Diesel
 - b) Eskom
 - c) Petro SA
 - d) **Coal**

2. The law of conservation of energy states...
 - a) Energy can either be created or destroyed
 - b) Energy is always wasted in a process
 - c) Energy is stored in a system as chemical energy
 - d) **Energy can neither be created nor destroyed**

3. Which of the following was developed for observing the pattern of celestial bodies?
- a) **Telescope**
 - b) Calendar
 - c) Phases of the Moon
 - d) The Sun
4. The tendency of objects to attract each other is called...
- a) its mass
 - b) its rotation
 - c) **gravity**
 - d) an attractive source
5. Which of the following is an example of a renewable source of energy?
- a) Petrol
 - b) Uranium
 - c) Coal
 - d) **Hydropower**
6. Input energy is the _____ of energy needed for a device to operate properly.
- a) percentage
 - b) increase
 - c) **amount**
 - d) electrical use
7. A turbine uses wind and falling _____ to rotate.
- a) **water**
 - b) sunlight
 - c) fans
 - d) electricity
8. A pylon is a large.....
- a) generator
 - b) cable
 - c) appliance for plug sockets
 - d) **large metal tower carrying electricity**
9. The imaginary line going through the Earth's centre from the north to the south is called Earth's _____.
- a) tilt
 - b) **axis**
 - c) rotation
 - d) globe



I think this wrapping is moving the alignment. Change it to in front of text

10. Life on Earth needs _____ to survive.
- wind
 - life cycles
 - energy**
 - fresh food

Total: 10

QUESTION 2 – CORRECT WORDS IN BRACKETS

(5)

Choose the correct answer from the words in brackets for each of the following. Write down only the number and your answer.

- Heat moves from an object of a body of (lower/higher) heat to an object of (lower/higher) heat. (1)
- Metals are (good/poor conductors) of heat. (1)
- An insulator is a material that transfers heat energy (easily/poorly). (1)
- In a solar collector a (black/shiny/white) surface absorbs sunlight. (1)
- The Sun is the (smallest/ largest/ medium) star in the Solar system. (1)

Total: 5

QUESTION 3 - DEFINITIONS OF THE FOLLOWING TERMS

(7)

Define each of the following terms. Write the number and the definition next to the number.

- Hydro-energy
It is obtained from falling water and the plant is usually built in a river.
- Solar water heating system
It cuts costs by up to 50%. When there is not enough sunlight, the water can be heated by electricity.
- Ecliptic
One of the earliest observations of predictable patterns from Earth is the ecliptic path across the sky that the sun appears to travel over a course of a year.
- Mass
It is the amount of matter in an object.
- Astronaut
An astronaut is a person who travels into space.
- Radiation
The transfer of heat energy by electromagnetic waves.
- Spring tide
When the high tide is extra high and the low tide is extra low.



Total: 7

QUESTION 4 -TRUE OR FALSE**(10)**

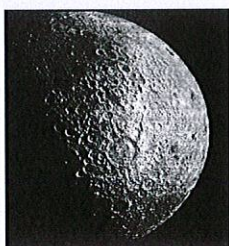
Say whether the following statements are TRUE or FALSE. If FALSE, correct it to make it TRUE.

1. Energy is measured in units called the kilojoule (K j). **FALSE. It is measured in Joule (J).**
2. You can prevent heat energy from being lost from the surface of a geyser by covering it with an insulator such as a geyser blanket. **TRUE.**
3. Days are longer than nights at the equator. **FALSE. Days and nights are equal.**
4. The Sun revolves around the Earth once in 24 hours. **FALSE. The Earth orbits the Sun.**
5. Nicolaus Copernicus suggested that the sun is the centre of the solar system. **TRUE.**
6. The chemical energy in petrol is converted into potential energy, to drive a car. **FALSE. Converted into movement or kinetic energy.**

Total: 10**QUESTION 5 –MATCH THE COLUMNS**

Match Column A with the correct answer in Column B. Write only the letter next to the correct number, e.g. 1 C **(7)**

COLUMN A	COLUMN B
1. Insulator	A A source of energy that can be replaced.
2. Thermal system	B The energy an object has due to moving/ movement.
3. Firewood	C The line dividing the lit half of the Earth from the dark half.
4. Kinetic energy	D The transfer of heat energy by electromagnetic waves.
5.Circle of illumination	E A toy boat moved by stirring the water in a swimming pool.
6. Potential energy	F Causes air pollution.
7.Biofuels	G Bed socks will keep your feet warm, usually in winter and is called....
	H. It is obtained by burning natural matter such as firewood and cow dung.
	I. Energy stored in an object or system.

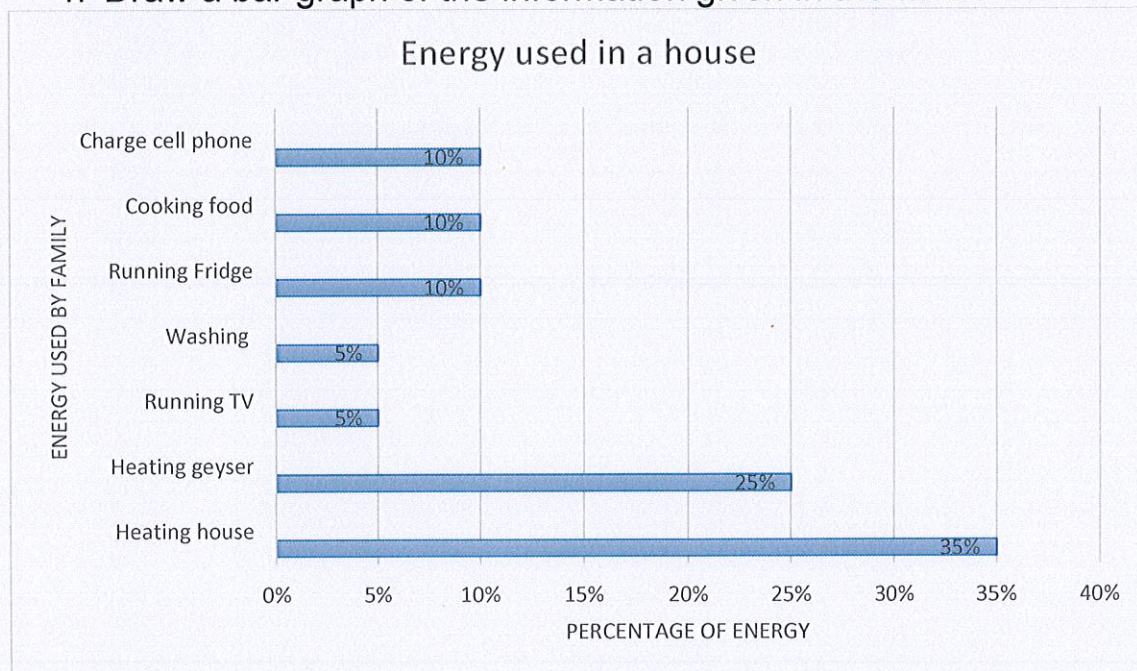
**1 G****2 E****3 F****4 D****5 C****6 B****7 H**

QUESTION 6- TABLE INFORMATION

The table below shows the percentage of energy used in different ways by an urban family. Answer the questions below the table. (9)

USE	PERCENTAGE OF TOTAL AMOUNT OF ENERGY USED
Heating the house	35%
Heating water (geysers)	25%
Running TV and laptops	5%
Running the washing machine	5%
Running the fridge and deepfreeze	5%
Cooking food on the stove	10%
Charging cell phones	10%

1. Draw a bar graph of the information given in the table. (5)



2. Suggest one thing this family could do to insulate their home to save money. Explain why your suggestion would help. (2)

Use energy saving light bulbs throughout the entire house.

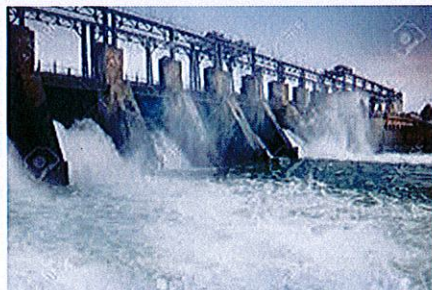
Make use of skylights for natural light.

Switch all electrical appliances off when not in use.

Switch the geyser off daily.

It will help because they will save more energy by using different light bulbs, etc.

Any suitable reason.



3. Explain how traditional homes in South Africa are built so that they stay cool in hot summer weather. (2)

A traditional home is built with the most windows and the house facing the North, so that it will receive the most sunlight in the afternoon and in the mornings it will be cooler.

Total: 9

QUESTION 7- CASE STUDY AND QUESTIONS

(9)

Read the case study below the questions carefully and answer the questions.

CASE STUDY: MUSHROOM INSULATION

In 2009 two mechanical engineering students, Gavin Mc Intyre and Eben Bayer, became the fathers of Greensulate, an insulator used in sustainable housing. They started out by growing mushrooms under their beds!

After many experiments, they patented their unique biomaterial. Starch is obtained from by-products collected from farms, such as rice hulls and buckwheat husks. These are mixed with water and hydrogen peroxide, and poured into a mould.

Cells from the oyster mushroom are injected into the mix. The roots of the mushrooms grow into a network that resembles fibres. Growth takes place in the dark and at room temperature. After about two weeks of growth, the mesh is dried and ready for use.

Greensulate traps more heat than newspaper or fibreglass and is fire-resistant. It is biodegradable and much cheaper to produce than insulators such as Styrofoam and plastic. This makes it an environmentally friendly alternative for insulation.

QUESTIONS:

1. What do you think the phrases “sustainable housing” and “patented” mean. (2)

Homes are designed to reduce the overall environmental impact to meet the needs of people.

Patented is an invention that you sell as the only owner/ designer with your own logo.

2. What organism have the two men used to make insulation? (1)

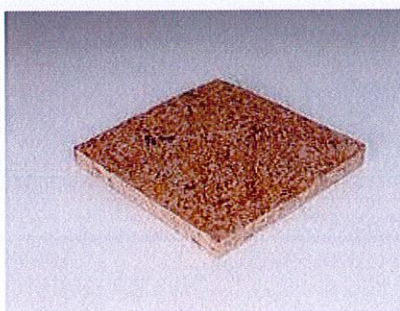
Growing mushrooms.

3. List three other insulators mentioned in this article. (3)

Starch

Buckwheat husks

Rice hulls



4. Why do you think the men named this insulation material Greensulate?
Greensulate? (1)
Because it is environmentally friendly and South-Africa is trying to go "green"
5. Give reasons why Greensulate is a better material to use for insulation than the other materials mentioned. (1)
Greensulate traps more heat than newspaper / fibreglass and it is fire-resistant.
6. Identify one disadvantage of using Greensulate as an insulator. (1)
It is only available after two weeks of growth and it takes a long time period to mix and pour into moulds.

Total: 9

QUESTION 8- QUESTIONS CONTAINING IMAGES:

8.1 Look carefully at the simplified diagram of a coal-fired power station. Explain in 4-5 sentences what the various parts are used for. Look specifically at the furnace, boiler, turbine and cooling tower. (4)

Coal is the fuel that is used to produce electricity.

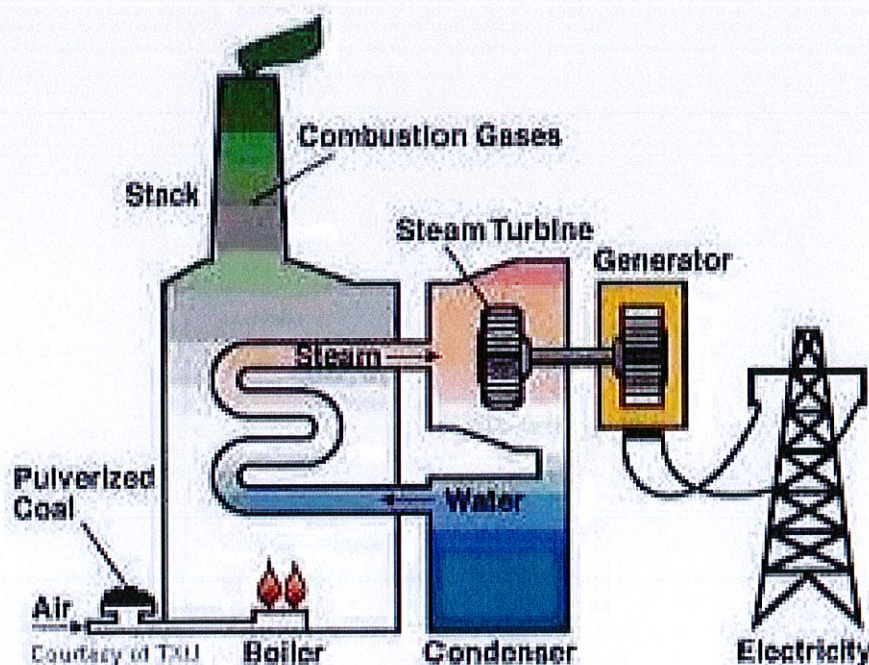
The furnace is where potential energy of the coal is being release by burning the coal.

The burning coal heats the water boiler.

In the boiler, heat from the burning coal heats up pipes full of cold water. The heat boils the water and it turns into steam.

Turbine: The steam flows around the turbine and makes the blades of the turbine turn.

Cooling Tower: The large cooling towers make the turbine more efficient. Boiling hot water from the steam turbine is cooled and then sprayed into the giant cooling towers where it is then pumped back to the boiler for re-use.



8.2 Name the images below. Explain where they are seen and / or what they are used for. (3)

a) A petrol tanker. It is used to transport petrol to Shell petrol garages



b) A telescope. Used to observe planets and stars.



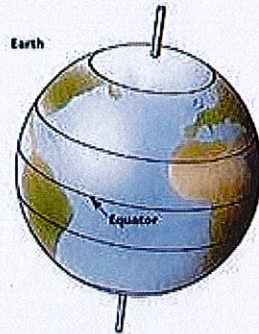
c) Solar panels on a roof. It is used to heat up pools.



8.3 In the image below you can see the Earth and the equator. Name the other two imaginary lines which have not been labelled and explain the tilt of the earth and the axis of the Earth. (3)

Tropic of Cancer and Tropic of Capricorn.

The Earth has an imaginary line called the axis. It is slightly tilted at $23,5^\circ$
 Earth orbits around the sun on a daily basis.



4
 8.3 The sun, moon and Earth are all held in position in the solar system by gravity. (1)

5
 8.4 Kelp has a root-like structure to help it attach to rocks to keep it in place. (1)

6
 8.5 Clams and mussels can close their shells tightly. (1)

Total: 13

Grand total: 70