

WARNING
You must return this paper with your answer-book, otherwise marks will be lost.



Coimisiún na Scrúduithe Stáit State Examinations Commission

JUNIOR CERTIFICATE EXAMINATION, 2008

SCIENCE – HIGHER LEVEL
(N.B. Not for *Science – Local Studies* candidates)

THURSDAY, 12 JUNE – MORNING, 09.30 to 12.00

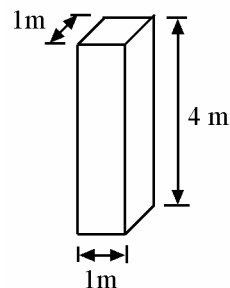
SECTION A (144 marks) TO BE ANSWERED BY ALL CANDIDATES.

(See separate sheet for **Sections B, C, D and E.**)

Answer *each* of the questions 1, 2 and 3. There are **TEN** parts in each question. Answer any **EIGHT** parts. All questions carry equal marks. Answer the questions in the spaces provided. Return this section of the examination paper. Enclose it in the answer-book you use in answering the other sections.

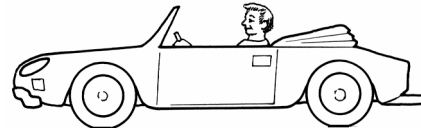
1. Answer **eight** of the following, (a), (b), (c), etc.

- (a) The diagram shows a concrete column.
Calculate the *density* of the column if its mass is 8 800 kg.



[Turn over

- (b) A driver applied the brakes of a moving car and it stopped after travelling 20 m. Calculate the *work done in stopping the driver* if the average force applied to him, by the seat belt during the braking, was 150 N.



- (c) Define *momentum*.



- (d) Explain the *difference* between electrical conductors and electrical insulators. Make *reference in your answers to electric current*.

Conductors _____

Insulators _____

- (e) The photograph shows ‘Wavebob’ which changes the energy of waves into electrical energy off the Galway coast. A full scale version could provide 1 MW.

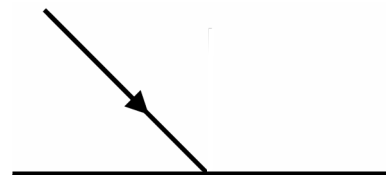


Give **one advantage** and **one possible disadvantage** of this way of generating electricity.

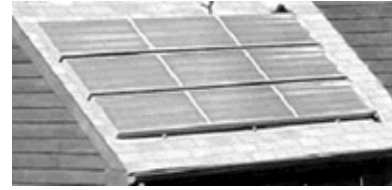
Advantage _____

Disadvantage _____

- (f) The diagram shows a ray of light striking a flat surface. The surface *reflects* the light. Draw the *reflected ray* in the diagram. Lenses change the direction of light in a different way. What is this *change* of direction of light called?



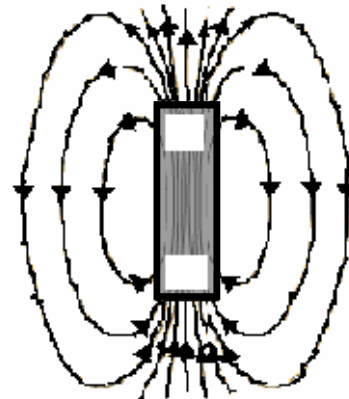
- (g) The photograph shows panels on the roof of a house in Ireland, which heat water by solar heat energy. How does the *sun's heat* reach the earth? Suggest a '*back-up*' energy source for heating the water during dull days.



How _____

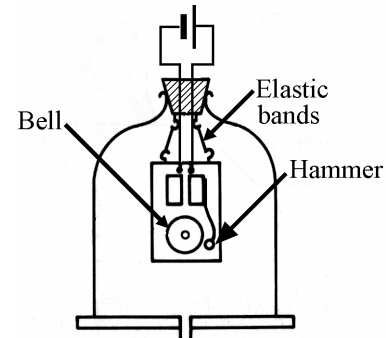
Suggestion _____

- (h) Label the *north pole* of the bar magnet with field lines shown in the diagram, with an 'N'. Give a *reason* for your selection of location for the north pole.



Reason _____

- (i) The diagram shows an apparatus used to investigate the transmission of sound. At the start, ringing was heard and the hammer was seen hitting the bell. A *procedure* was carried out and while the hammer was still seen hitting the bell no ringing was heard. What *procedure* was carried out?



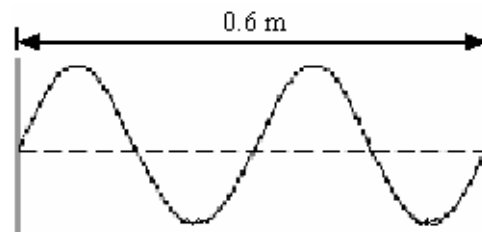
Procedure _____

What does this experiment tell us about sound?

- (j) How *many* waves are shown in the diagram?

How many? _____

Calculate the *speed* of this wave if its frequency is 1 kHz.



(8 × 6)

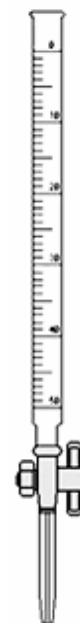
2. Answer **eight** of the following, (a), (b), (c), etc.

(a) Name the piece of laboratory glassware shown in the diagram.

Name _____

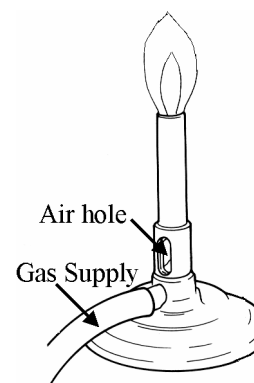
Give a *use* for this item in experimental work in a laboratory.

Use _____



(b) The diagram shows a Bunsen burner. The gas supply is turned on full and the air hole is fully open. Why does this setting give the hottest flame?

Clearly label the hottest part of the flame in the diagram.



(c) A pupil measured the pH of two substances. The pH of lemon juice was 2.4 and the pH of household ammonia was 11.5. What do these measurements *tell us* about the two substances, apart from their pH values?

Lemon juice _____

Household ammonia _____

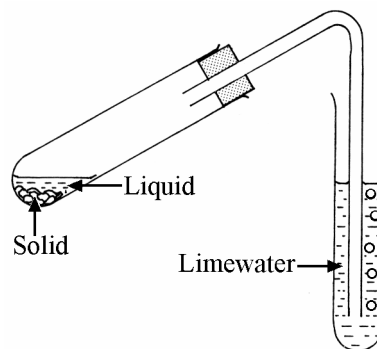
(d) The hazard symbol shown is on a container in a school laboratory. What does the *symbol* tell us about the substance in the container? Name a *substance* that would be labelled in this way.



What? _____ Name _____

(e) Explain the term *corrosion* when applied to metals.

- (f) The liquid and the solid shown in the diagram react together to produce a gas which turns limewater milky. Name a *liquid* and a *solid* that react together in this way.

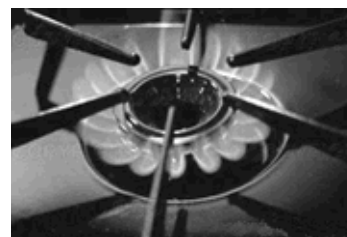


Liquid _____

Solid _____

- (g) How would you *test* a sample of hard water to see if the hardness was *temporary* or *permanent*?

- (h) The photograph shows natural gas burning on a domestic cooker hob. Natural gas is methane, and its formula is CH_4 . Complete the *equation* below for the combustion of methane.



- (i) Magnesium has atomic number twelve. How many *orbits (shells)* of a magnesium atom have electrons in them? In which *period* of the periodic table is magnesium?

How many? _____ Which period? _____

- (j) Give **one safety precaution** taken by the pupil shown in the photograph, while doing an experiment in a school laboratory.



Precaution _____

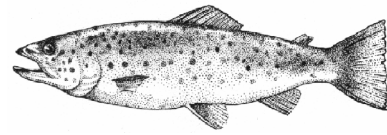
Describe a **precaution, not shown** in the photograph, that you would take when **heating a substance** in a test tube in a school laboratory.

Precaution _____

[Turn over]

3. Answer **eight** of the following, (a), (b), (c), etc.

- (a) The trout is adapted to its habitat.
[You can select another named organism, if you wish, to answer this question.]



Give **one** *adaptation* of your selected organism. What is a *habitat*?

Organism _____ Adaptation _____

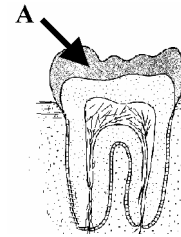
Habitat _____

- (b) The diagram is of a tooth. Name the *part* labelled A.

Part A _____

Name the type of tooth shown in the diagram.

Name _____



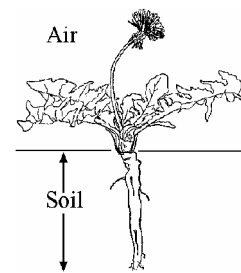
- (c) Both animals and plants are composed of cells. Name a *structure* that is *common* to *both* animal and plant cells.

Name of common structure _____

Name a *structure* that is *only* associated with *plant* cells.

Name _____

- (d) The diagram shows an entire dandelion plant.
Label clearly a *part* of the plant where *seeds* are *produced* using the letter 'S'.
Label clearly a *part* of the plant where *water* and *minerals* are taken into the plant using the letter 'W'.



- (e) Give **two** examples of *characteristics (traits)* that can be *biologically inherited* from our parents.

Example one _____

Example two _____

- (f) Butterflies and other insects disperse pollen.
Why is *pollen dispersal* important?

Why? _____

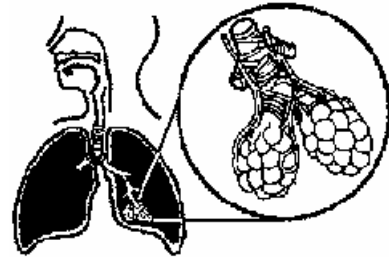
Give a **second** way, other than by insects, in which pollen is dispersed.

Way _____



- (g) What is *phototropism*?

- (h) The diagram shows a detail of the structure of the human lung. Alveoli (air sacs) with associated blood capillaries are drawn in the expanded portion of the diagram. Describe what *happens* between the air in the alveoli and the blood in the capillaries.



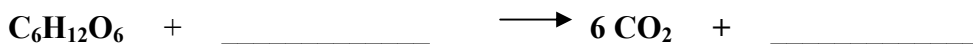
Description _____

- (i) The quadrat is used for sampling plants and animals living in a habitat.
Draw a *quadrat*, in the box provided.

Explain how to take a *random sample* using a quadrat.



- (j) Respiration releases energy from food in cells. Complete the *equation* for the aerobic respiration of glucose.



(8 × 6)

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