EXAMINATIONS COUNCIL OF ZAMBIA
JUNIOR SECONDARY SCHOOL LEAVING EXAMINATION (GRADE 9) - 2012
ENVIRONMENTAL SCIENCE 502/2
PAPER 2

(INTERNAL AND EXTERNAL CANDIDATES)

TIME: 2 HOURS MARKS: 60

An extra 10 minutes will be given to you so that you complete your particulars on the Answer Booklet before you start writing.

INSTRUCTIONS TO CANDIDATES

1. Pull out the Answer Booklet from the middle of the question paper.
2. Write your name, examination number, school / centre name and code on the Answer Booklet.
3. Write your answers in the spaces provided in the Answer Booklet.
4. Answer ALL the questions.
5. Cell phones are not allowed in the examination room.
6. Calculators are not allowed in the examination room.

DO NOT TURN THIS PAGE UNTIL YOU ARE TOLD TO DO SO.

This question paper consists of 11 printed pages.
1 WATER

Study the diagram below showing the experiments on growing crystals.

(a) Name the gas in the air which reacts with the damp iron metal. [1]

(b) State the colour the iron will change to after the reaction. [1]

(c) (i) Predict the change in the water level in the test tube after the reaction. [1]

(ii) Give a reason for your answer. [1]

(d) State what would happen to the water level in the test tube if copper was used instead of iron. [1]

(e) Name one metal that reacts faster with water compared with iron. [1]

Total = 6 marks
2 ELECTRICITY

The diagram below shows an electric appliance.

(a) What effect of an electric current is being demonstrated in the diagram? [1]

(b) (i) Which metal element could be used as a coil for element A? [1]

(ii) Give a reason for your answer. [1]

(c) Name one other appliance which uses the electric current effect demonstrated above. [1]

(d) State one difference between element A and a similar element in an electric bulb? [1]

(e) Which effect of electricity is experienced in both the heater and the bulb? [1]

Total = 6 marks
3 GASES

The diagram below shows an experiment with oxygen gas

(a) What will be observed when the oxygen gas is poured onto the burning candle? [1]

(b) When the experiment above is repeated with a different gas and the flame is put off, what would be the gas? [1]

(c) What property of oxygen makes it possible to be poured downwards? [1]

(d) Name one natural process that releases oxygen into the atmosphere. [1]

(e) What catalyst is used when oxygen is prepared from hydrogen peroxide? [1]

(f) Give one use of oxygen in manufacturing industries. [1]

Total = 6 marks
4 LIGHT

Figure 1.0 shows light passing from glass into water while Figure 2.0 shows light passing from air to water.

(a) What do the broken lines represented by letters labelled B stand for in both Figures 1.0 and 2.0 above? [1]

(b) State the term given to the bending of light shown in Figure 1.0 above. [1]

(c) Explain why the rays of light bend away from line B when it passes into the water in Figure 1.0. [1]

(d) Extend the rays of light from a point labelled C to show how it passes through water in Figure 2.0. (Draw on the diagram in the Answer Booklet) [2]

(e) In which of the three media in the experiments (glass, water or air) is the density the highest? [1]

Total = 6 marks
5  PLANTS

Three potted plants were kept in a dark cupboard for two days before being used for an experiment. Each plant was then put under a bell jar under different conditions as shown for six hours.

(a) Explain why there was no starch in the leaves at the end of the two days in the cupboard. [1]

(b) What was the purpose of sodium hydroxide solution before the plants were put under bell jar in D? [1]

(c) Suggest why the bell jar in F was covered with aluminium foil. [1]

(d) After five hours, a leaf from each plant was taken and tested for starch.

(i) State whether starch will be present or absent in experiment D. [1]

(ii) What would be the colour changes in leaves in experiments E and F? [2]

Total = 6 marks
The diagram below shows the skull of a dog.

(a) Identify the modified teeth labelled G. [1]

(b) Using the letter H, label on the diagram in your Answer Booklet the teeth used for gripping and tearing flesh. [1]

(c) Complete the dental formula below for the dog by identifying I and J
\[ i \frac{3}{3}, c, p m \frac{1}{4}, m \frac{2}{3} \] [2]

(d) During the nursing period most bitches (female dogs) become fierce and aggressive. Suggest one reason for this behaviour. [1]

(e) Give one difference between dentition in a dog and that of a goat. [1]

Total = 6 marks
Study the diagram showing an experiment on separation techniques.

(a) (i) Mention one mixture which can be separated by the technique shown above. [1]

(ii) Suggest a solvent for the mixture you have mentioned in a(i) above. [1]

(b) What property of the filter paper makes it possible for it to be used in the separation technique? [1]

(c) What name is given to the band of colours that will be formed on the filter paper after separation? [1]

(d) State one industrial application of this separation technique. [1]

(e) Which separation technique will be the most suitable to separate salt from its solution? [1]

Total = 6 marks
8 MAN

In modern farming, farmers practice cross and in breeding.

(a) Why do farmers practice;
   (i) cross-breeding? [1]
   (ii) in-breeding? [1]

(b) Write down one quality a farmer would like to have in each of the following.
   (i) chickens that produce eggs (layers) [1]
   (ii) maize [1]

(c) In each case state one advantage and one disadvantage of artificial insemination. [2]

Total = 6 marks
9 ENERGY

The diagram below shows one method of producing electricity.

(a) What type of power station is shown in the diagram above? [1]
(b) What does the letter K represent? [1]
(c) Explain why the dam wall is thicker at the bottom than at the top. [1]
(d) Which place M or N will be most suitable for constructing a tunnel to deliver water to K? [1]
(e) (i) State one advantage of such a type of a power station. [1]
(ii) State one disadvantage of such a type of a power station. [1]

Total = 6 marks
10 ECOLOGY

The graph below shows the population of two neighbouring countries P and Q for the period 2000 to 2010.

(a) In which year was the population of country P seven million? [1]

(b) In which country was the population increasing yearly between 2000 and 2008? [1]

(c) Suggest two reasons why the population of the country mentioned in (b) above, kept on increasing during that period. [2]

(d) Give one reason why the population of Country Q remained constant between 2002 and 2004. [1]

(e) Suggest a year in which Country Q could have experienced a civil war. [1]

Total = 6 marks