ZIMBABWE

MINISTRY OF HIGHER AND TERTIARY EDUCATION

HIGHER EDUCATION EXAMINATIONS COUNCIL (HEXCO)

NATIONAL DIPLOMA

IN

ENVIRONMENTAL HEALTH

SUBJECT: Physical Science **PAPER NO: 605/S05**

NOVEMBER/DECEMBER 2010 EXAMINATION

REQUIREMENTS

INSTRUCTIONS TO CANDIDATE

1. Answer all questions in Section A.
2. Answer any (2) questions in Section B
3. Answer any (2) questions in Section C.
4. Take acceleration due to gravity g = 10m/S

This paper consists of 4 printed pages.

CH_2

PAPER NO: 605/S05 – PHYSICAL SCIENCE

SECTION A

QUESTION 1

What do you understand by the following terms?

(i) Atom (2 marks)
(ii) Molecule (2 marks)
(iii) Element (2 marks)
(iv) Isotope (2 marks)
(v) Compound (2 marks)

QUESTION 2

(a) A piece of solid steel sinks in water where as a ship made of steel floats. Explain why this is so. (5 marks)
(b) Identify the principle that is used in (a) above and state clearly what it says. (5 marks)

QUESTION 3

(a) Methane is a hydrocarbon. What is a hydrocarbon? (2 marks)

(b) Methane and ethane are saturated, other hydrocarbons are said to be unsaturated e.g. ethene. Describe a chemical test to distinguish ethane and ethene (4 marks)

(c) Define a homologous series. (2 marks)

CH_2

QUESTION 4

(a) (i) State the difference between mass and weight. Give the SI Unit for each quantity. (2 marks)
(ii) How much work does a man do when he lifts a bag of mass 50kg to a trunk 1.5 m high? (2 marks)

(b) A body of mass 3.0 kg moving at 1.0 m/s is accelerated at 3.0 m/s^2 for 5.0s.
Calculate the:

(i) Final velocity (2 marks)
(ii) Displacement (2 marks)
(iii) Change in kinetic energy (2 marks)

$F = Ma$

$m = 3.0kg$

$v = u + at$

$v^2 = u^2 + 2as$

$s = ut + \frac{1}{2}at^2$

SECTION B

Answer any two questions.

QUESTION 5

Draw dot and cross diagrams for the following compounds

(i) Sodium fluoride (3 marks)
(ii) Carbon dioxide (3 marks)
(iii) Calcium chloride (3 marks)
(iv) Magnesium oxide (3 marks)
(v) Water (3 marks)

QUESTION 6

(a) Describe three methods by which dangerous chemicals can enter into our bodies and cause harm without us noticing it. (6 marks)

(b) Name three bases used in hospital and give one medical use for each. (6 marks)

(c) Explain why acids are usually in containers made of glass. (1 mark)

(d) What treatment should be given when an acid is accidentally spilled on skin. (2 marks)

QUESTION 7

(a) Magnesium burns brilliantly in air forming magnesium oxide. Write down a balanced ionic redox equation for the reaction. (5marks)

(b) Explain how the following occur in the reaction
(i) Oxidation (5 marks)
(ii) Reduction (5 marks)

SECTION C

Answer any two questions from this Section.

QUESTION 8

(a) Define;
(i) Density
(ii) Force
(iii) Pressure (3 marks)

NaOH

(b) A rectangular block of mass 15 00g has dimensions 0.3 x 0.2 x 0.1m.
(i) Calculate the density of the block. (2 marks)
(ii) What is the weight of the block? (2 marks)
(iii) If the block is put on the table determine the maximum pressure it exerts when lying on the surface. (3 marks)

(c) Discuss how the following radio active particles are affected by magnetic and electrical fields.
(i) Alpha
(ii) Beta
(iii) Gamma (6 marks)

QUESTION 9

(a) Distinguish the following.
(i) Scalar and Vector quantities
(ii) Speed and acceleration. (4 marks)

(b) If a body starts with a velocity (u) and has a constant acceleration over the period (v) the expressions for its;
(i) Displacement (1 mark)
(ii) Final velocity (1 mark)

(c) A body of mass 5.0kg starts with a velocity u = 4.0 m/s and accelerates at a = 2.6 mls^2 for 10 sec, it then continues with a constant velocity for 20 sec and is brought to rest by constant force within 6.0 seconds.

Find the total displacement with the aid of:

(i) Velocity time graph. (5 marks)
(ii) Force which brings the body to rest. (2 marks)

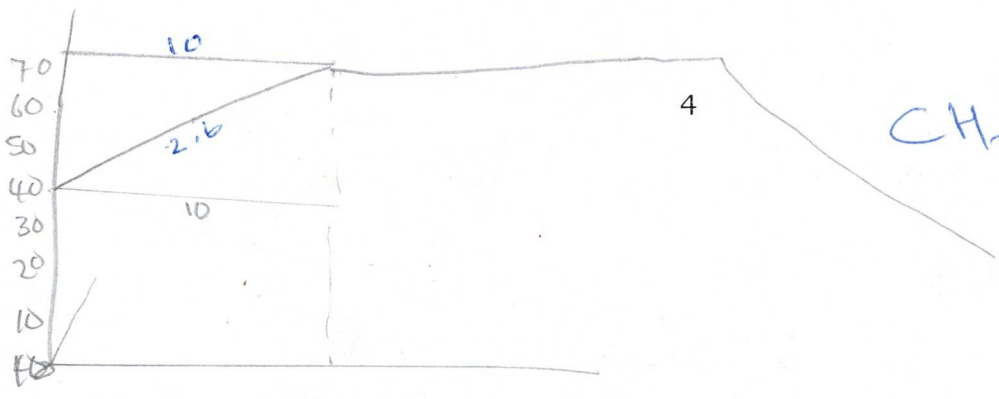
(d) State what happens to the kinetic energy when the body is brought to rest. (1 mark)

QUESTION 10

Explain the concept of heat transfer under the following;

(a) Conduction (5 marks)
(b) Convection (5 marks)
(c) Radiation (5 marks)

.../1k



$v = u + at$
$v = 40 + 2.6 \times 10$
66 mad

CH_2

$h^2 = a^2 + b^2$
$20^2 =$ 106.76