INTEGRATED SCIENCE 2

1. GENERAL COMMENTS

The standard of the paper compared favourably with those of previous years. Candidates' performance was better than the previous years.

2. A SUMMARY OF CANDIDATES' STRENGTHS

Candidates were commended for the following features in their responses to the questions.

(1) Candidates exhibited clear understanding of the rubrics of the paper.

(2) Most candidates had legible handwriting.

(3) Candidates orderly numbered and presented their responses to the questions they attempted.

3. A SUMMARY OF CANDIDATES' WEAKNESSES

Candidates demonstrated the following weaknesses:

(1) Many candidates could not spell scientific terms/phenomena correctly.

(2) Many candidates exhibited poor command of the English Language in their responses provided.

(3) Majority of the candidates could not give the systematic names of chemical compounds.

4. SUGGESTED REMEDIES

The following remedies were suggested:

(1) Students should be encouraged to spell correctly scientific terms and phenomena.

(2) Students should be encouraged to read more scientific materials and story books to improve upon their usage of the English Language.

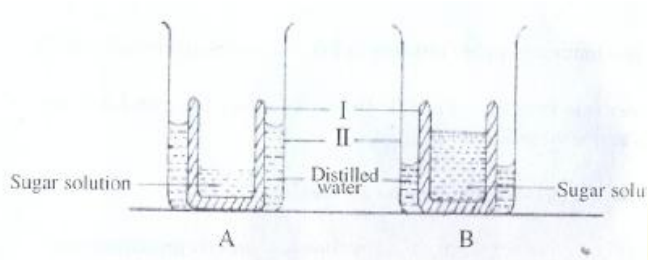
(3) Teachers should endeavour to cover the entire syllabus with their students before they take the examination.

5. DETAILED COMMENTS

Question 1

(a) The diagrams below are illustrations of an experiment to demonstrate a biological principle.

Study the diagrams carefully and answer the questions thatfollow.



(i) Name the parts labelled I and II.

(ii) State two differences between the set-ups A and B.

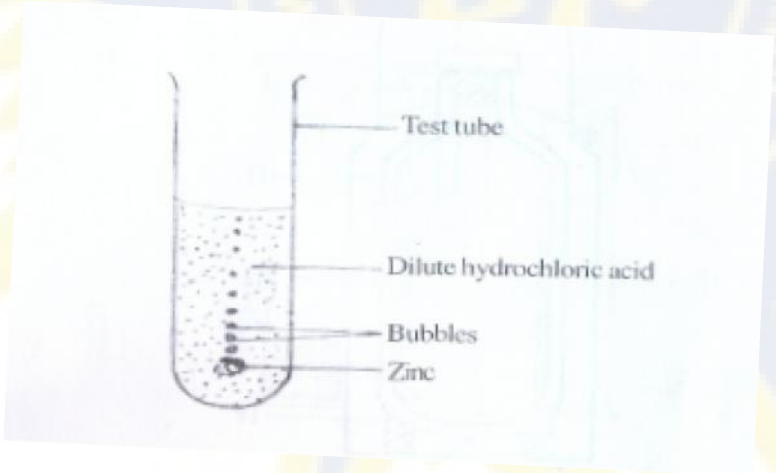
(iii) What is the role played by the part labelled I in the experiment?

(iv) Name the biological principle being demonstrated in this experiment.

(v) State one way in which plants benefits from the principle named in (iv).

(vii) State one way in which animals benefit from the principle named in (iv).

(b) In an experiment to investigate the reactivity of zinc, a piece of the metal was dropped into a test tube containing dilute hydrochloric acid. The experiment set-up is illustrated below.



Study the set-up carefully and answer the questions that follow.

(i) Write a balanced chemical equation for the reaction that occurred in the experiment.

(ii) Name the gas evolved.

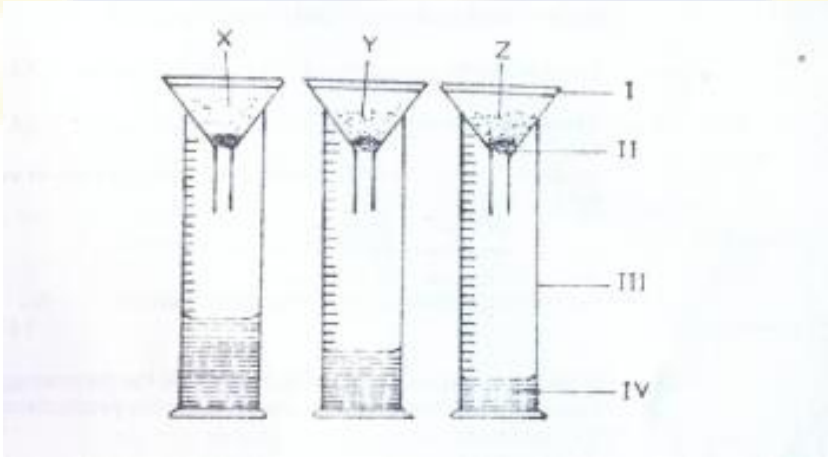
(iii) List two metals which can react in a similar way as the zinc.
(iv) List two metals which cannot react in a similar way as the zinc.

(v) Name two glass apparatus which could have been used instead of the test tube.

(c) The diagram below is an illustration of a thermos flask.

Study the diagram carefully and answer the questions that follow.
(i) Name the parts labelled I, II, III, IV and V.
(ii) How does the device minimize heat loss or gain through
(α) conduction?
(β) convection?
(γ) radiation?
(iii) State one use of the thermos flask.

(d) The diagrams below illustrate an experimental set-up on a physical property of soil using three soil types X, Y and Z.



Study the set-up carefully and answer the questions that follow:
(i) Name the parts of the set-up labelled I, II, III and IV.
(ii) Which of the three soil types has the
(α) highest water holding capacity?

(β) least water holding capacity?

(iii) Name each of the three soil types X, Y and Z.

(iv) Suggest a suitable title for the experiment.

(a) Many candidates were able to name the parts labelled I and II as fresh yam cup and beaker respectively. Candidates were able to state the difference between set-ups A and B. The role played by the part labelled I is that it acts as a semi-permeable membrane. Candidates stated correctly the principle being demonstrated as osmosis. Many however could not spell the wordosmosis correctly. Majority of the candidates could not state the ways animals and plants benefit from osmosis.

(b) This part of the question was generally poorly answered by many candidates. Majority of the candidates could not write a balance equation for the reaction that occurred. Many were however able to name the gas evolved as hydrogen. Few candidates were able to list the metals which react in a similar way as the zinc as sodium, calcium, magnessiumetc and also correctly listed metals which do not react in a similar way as zinc as copper, silver gold etc. Many candidates also correctly stated that instead of the test tube, a beaker, conical flask, flat bottomed or boiling tube could be used in the experiment.

(c) Majority of the candidates were able to identify the parts of the thermos flask labelled. Many were able to state how the thermos flask minimise heat losses/gain through conduction, convection and radiation. The thermos flask is used to keep cold substances/hot substances or to keep substances at a specific temperature.

(d) Candidates performed very well on this sub-question. Many candidates were able to name the parts of the experiment labelled I, II, III and IV. The soil sample with the highest water holding capacity was correctly identified as soil sample Z and the soil sample with least water holdling capacity is soil sample X. The three soil samples X, Y and Z were identified as sandy soil, loamy soil and clayey soil respectively. The title for the experiment illustrated was: An experiment to demonstrate the water holding/porosity of the soil.

Question 2

(a) List the three particles which make up matter.

(b) State four hereditary features in humans.

(c) State the energy transformation that takes place in each of the following activities:

(i) dry cell in use;

(ii) solar panel in use;

(iii) electric stove in use;

(iv) hammering of a piece of metal.

(d) State two ways each in which each of the following cultural practices is important in vegetable production:
(i) staking;
(ii) pruning.

(a) Many candidates who attempted this question confused particles that make up matter with states of matter. The expected answers were atoms, molecules and ions. Many candidates however stated solids, liquids and gases.

(b) Many candidates understood the question but provided the wrong responses. Some heritable features are weight, colour of hair shape of nose/head/face etc and blood group.

(c) Candidates found it difficult to state the energy transformed that take place in the activities listed. The expected answers were:
(i) Chemical → electrical
(ii) Solar/light → electrical
(iii) Electrical → Heat
(iv) Heat/light/sound/chemical → mechanical → heat/light/sound.

(d) Many candidates were able to state the importance of staking and pruning in vegetable crop production. Staking; supports weak/climbing stems, promotes air circulation, allow for easy penetrating of sunlight. Staking helps to produce clean fruits, it helps protects fruits from diseases/pest. Pruning on the other hand encourages easy harvesting, it promotes light penetration and helps prevent the spread of pest.

Question 3

(a) (i) What is indiscriminate sex?
(ii) Give two reasons why teenagers indulge in indiscriminate sex.

(b) Name two sources each of
(i) natural light;
(ii) artificial light.

(c) State three ways in which soil texture is important in cropproduction.

(d) Write down the systematic name of each of the following chemical compounds:
(i) FeS;
(ii) CO;
(iii) Cu_2O;
(iv) NaOH.

(a) Many candidates were able to define indiscriminate sex. They also correctly stated the reasons why teenagers indulge in indiscriminate sex.

(b) Sources of natural light are the sun, fireflies, stars, lighting etc. The moon is not a source of natural light as stated by some candidates.

(c) Many candidates found it difficult to state the ways in which soil texture is important in crop production. The expected responses are that the soil texture:
- ithelps the farmer to know the type of farming method to adopt
- it influences the water holding capacities of the soil
- it influences soil temperature
- theknowledge of sol texture determine the soil management practice to adopt.

(d) Many candidates could not write down the systematic names of the compound given. The expected answers are:

(i)	FeS;	Iron (II) sulphide
(ii)	CO;	Carbon (II) oxide
(iii)	Cu_2O;	Copper (I) oxide
(iv)	NaOH	sodium hydroxide

Question 4

(a) (i) What do the symbols L, N and E represent in an electric plug?
(ii) What is the function of the fuse box in household electrical writing?

(b) Mention four classes of insect pest based on their feeding habits.

(c) Classify the first four elements of the periodic table as *metals and non-metals*.

(d) Name the three types of blood vessels in humans.

(a) In an electric plug the symbol L represents live, N is for neutral and E is for earth. Only few candidates could state that a fuse box contains thin wires which melt and cut off current when the current passing through it is too large.

(b) This question was difficult for most candidates. Classes of insects based on their mode of feeding are Biting/tearing insects, boring insects, piecing insects chewing/ rasping insects and sucking insects.

(c) Candidates were able to state and classify the first four elements into metals and non-metals as follows.

Metals	Non - metals
Lithium	Hydrogen
Beryllium	Helium

(d) Candidates correctly stated the blood vessels as artery, vein and capillary.

Question 5

(a) (i) State the difference between organic fertilizer and inorganic fertilizer.
(ii) State two effects of inorganic fertilizer on the environment.

(b) Classify the following substances as acids or bases.
(i) unripe lemon juice;
(ii) wood ash;
(iii) liquid in a car battery;
(iv) bicarbonate of soda.

(c) (i) What is a fruit?
(ii) State two differences between a fruit and a seed.

(d) State the effect of heat on each of the following substances:
(i) plastics;
(ii) alcohol;
(iii) metal rod.

(a) Candidates were able to show the difference between organic and inorganic fertilizers by stating the following: Organic fertilizer is obtained from plant and animals whilst inorganic fertilixers are obtained from artificial / chemical materials. Inorganic fertilizer pollutes water / air / land; kills plants and other organisms in the soil, overuse of inorganic fertilizer damage crops.

(b) Majority of the candidates were able to classify the given substances as acids or bases.
(i) unripe lemon juice is anacid
(ii) woodash is a base
(iii) liquid in car battery is an acid
(iv) bicarbonate of soda is a base

(c) Many candidates could not define a fruit and many could not state the difference between a fruit and a seed. The expected

responses are that; a fruit is a structure that develop from a fertilised ovary, and contains a seed/seeds. The difference between a seed and a fruit is that, a fruit has two scars, whilst a seed has one scar. A fruit develops from an ovary whilst a seed develops from an ovule. Fruits containseeds whilst a seed contains an embryo.

(d) Many candidates were able to state correctly the effect of heat on the given substances. Plastics melts or burn on application of heat whiles alcohol expands, evaporates or boil onapplication of heat. Metals expands, melts or bends when heat is applied to them.

Question 6

(a) Classify the following chemical substances basd on their uses under the headings as shown in the table below:
Milk of magnesia, alcohol, paracetamol, sodium hydroxide, N.P.K.

Agriculture	Industry	Medicine

(b) State one use each of the following instruments used in the study of the weather:
(i) rain gauge;
(ii) hygrometer;
(iii) anemomoter.

(c) (i) Name two types of transistors.
(ii) Draw and label the circuit symbols of the transistors named in (i).

(d) State three reasons why vegetable farming is important.

(a) Most candidates were able to classify the given substances under the headings given N.P.K. is used in agriculture. Sodium hydroxide and alcohol are used in industry whiles milk of magnesia, paracetamol and alcohol are used in medicine.

(b) Majority of candidates were able to state one use of the instruments given when studying the weather.
(i) Rain guage is used to measure the amount of rainfall.
(ii) Hygrometer is used to measure relative humidity.
(iii) Anemometer measures wind speed.

(c) This part of the question was poorly answered by many candidates who attempted it. Even though some candidates were able to state the type of transistors as NPN and PNP transistors, they could not draw and label their circuit symbols.

(d) Many candidates were able to give reasons why vegetable farming is important. Vegetable farming provide income to farmers, it serves as a source of employment. Some vegetables produced from farms have medicinal value.