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WordPub

BECE

Integrated Science

Past Questions and Answers

2014

**Junior High School
Years 1, 2 & 3**

Compiled by:



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- **Teachers, parents and educational institutions** – for your continuous patronage and tireless efforts at ensuring quality education for the 21st century child
- Junior High School **students** – you are the ultimate reason for this work.

DEDICATION

To the Lord **Jesus Christ**, our Saviour and soon-coming King

JUNE 2014

INTEGRATED SCIENCE 1

OBJECTIVE TEST

45 minutes

1. Which of the following types of teeth is used by mammals to tear food material?
 - A. Canines
 - B. Incisors
 - C. Molars
 - D. Premolars

2. The eclipse formed when the moon comes between the sun and the earth is known as
 - A. annular eclipse
 - B. lunar eclipse
 - C. solar eclipse
 - D. total eclipse

3. The element with the chemical symbol **S** is
 - A. silicon
 - B. silver
 - C. sodium
 - D. sulphur

4. The term leaching in soils refers to
 - A. accumulation of organic matter
 - B. decomposition of plant material.
 - C. fixation of nitrogen
 - D. removal of soil nutrients by water.

5. Which of the following statements about a plant cell is **correct**? It
 - A. does not have a nucleus
 - B. contains large vacuoles
 - C. is surrounded by the cell membrane only
 - D. does not have a definite shape

6. An example of a *derived quantity* is
 - A. length
 - B. mass
 - C. temperature
 - D. volume

7. Solid non-metals normally break into pieces when hammered because they are
- A. brittle
 - B. ductile
 - C. lustrous
 - D. malleable
8. Young rabbits are called
- A. bunnies
 - B. cubs
 - C. fingerlings
 - D. kids
9. Producers in an ecosystem are plants that
- A. attract insects
 - B. feed on other plants
 - C. feed on dead materials
 - D. manufacture their own food.
10. The form of energy produced from the nucleus of an atom is termed
- A. chemical energy
 - B. mechanical energy
 - C. nuclear energy
 - D. thermal energy
11. Which of the following elements is a semi-metal?
- A. Carbon
 - B. Nitrogen
 - C. Silicon
 - D. Sodium
12. A system of farming that leads to continuous destruction of virgin forest is
- A. mixed farming
 - B. mixed cropping
 - C. pastoral farming
 - D. shifting farming
13. The by-products of respiration are
- A. carbon dioxide and heat
 - B. carbon dioxide and water
 - C. oxygen and heat
 - D. oxygen and water.
14. Which of the following statements about a force are **correct**? It
- I is measured in newtons
 - II is measured in newton-metre

- III can start a motion
- IV can change the direction of a moving body.

- A. I and II only
 - B. I and III only
 - C. I, III and IV only
 - D. I, II, III and IV
15. Which of the following substances is a solid-gas mixture?
- A. Lather
 - B. Bronze
 - C. Steel
 - D. Smoke
16. Weeds on a school farm could be controlled by
- A. handpicking
 - B. mowing
 - C. ploughing
 - D. tilling
17. An example of a non-living tissue used in osmosis experiment is
- A. cellophane
 - B. filter paper
 - C. potato
 - D. polythene
18. Kerosene is poured on the surface of a pond in order to
- A. make it unsafe for human consumption
 - B. make it safe for animal consumption
 - C. increase the surface tension
 - D. break the surface tension
19. Which of the following processes is used to separate insoluble solids from liquids?
- A. Crystallization
 - B. Evaporation
 - C. Filtration
 - D. Sublimation
20. The process of removing unproductive poultry birds from a flock is referred to as
- A. candling
 - B. culling
 - C. dehorning
 - D. drenching
21. Which of the following pairs of diseases can be spread easily when food is exposed to houseflies?

- A. Dysentery and malaria
 - B. Malaria and tuberculosis
 - C. Dysentery and cholera
 - D. Cholera and tuberculosis
22. The pressure in fluids
- A. acts differently in all directions
 - B. acts upwards at any point
 - C. decreases with depth
 - D. increases with depth
23. Which of the following processes involve a change in the state of matter from liquid to solid?
- A. Beans
 - B. Bread
 - C. Cabbage
 - D. Egg
24. Which of the following food items contains the **highest** amount of dietary fibre?
- A. Beans
 - B. Bread
 - C. Cabbage
 - D. Egg
25. An example of a disease vector is
- A. earthworm
 - B. liver fluke
 - C. tapeworm
 - D. tick
26. Which of the following devices is made of semiconductor?
- A. Capacitor
 - B. Inductor
 - C. Resistor
 - D. Transistor
27. Which of the following statements about the properties of water are **correct**? It
- I. is colourless and tasteless
 - II. is neutral to litmus paper
 - III. turns red litmus paper blue
 - IV. is a universal solvent
- A. I and II only
 - B. I and III only
 - C. I, II and IV only
 - D. I, III and IV only

28. The study of the soil profile of an area helps the farmer to
- control weed growth
 - determine the soil temperature
 - determine the types of crop to grow.
 - know the pesticides to use.
29. When a green leaf is placed in a test tube containing ethanol and heated over a water bath the leaf
- becomes soft
 - changes colour to brown
 - changes colour to blue-black
 - is decolourized.
30. Which of the following sources of energy is / are renewable?
- Solar
 - Crude oil
 - Wind
- I only
 - I and II only
 - I and III only
 - I, II and III
31. Which of the following substances is a compound?
- Hydrogen
 - Nitrogen
 - Oxygen
 - Water
32. A disease-causing organism that is **most** difficult to control in crop production is
- bacterium
 - fungus
 - nematode
 - virus
33. Which of the following organisms is/ are multicellular?
- Amoeba
 - Paramecium
 - Onion
- I only
 - III only
 - I and III only
 - II and III only

34. In electronic circuits, LEDs are used to indicate the absence or presence of
- A. emitter and collector
 - B. electric current
 - C. p-n junction
 - D. voltage source.
35. Steel is an alloy of iron and
- A. aluminium
 - B. carbon
 - C. silicon
 - D. gold
36. Soil aeration could be improved through
- A. mulching
 - B. irrigation
 - C. soil drainage
 - D. fertilizer application
37. Which of the following pairs of structures are part of the respiratory system of humans?
- A. Fallopian tube and alveoli
 - B. Pharynx and oesophagus
 - C. Trachea and alveoli
 - D. Trachea and duodenum
38. Which of the following effects is **not** a result of illegal connection of electricity? It can
- A. lead to fire outbreak
 - B. lead to frequent power cut-off
 - C. increase the flow of current in the supply chain.
 - D. cause damage to electrical appliance
39. Which of the following statements about the scientific method is / are **correct**? It provides
- I. logical procedure for arriving at knowledge.
 - II. knowledge that can be verified
 - III. knowledge that can never be changed
- A. I only
 - B. I and II only
 - C. I and III only
 - D. II and III only
40. An entrepreneur's decision as to what to produce is a/ an
- A. co-ordinating function
 - B. organizing function
 - C. planning function
 - D. supervising function.

END OF PAPER

JUNE 2014

INTEGRATED SCIENCE 1

OBJECTIVE TEST SOLUTIONS

1. A. canines
2. C. solar eclipse
3. D. sulphur
4. D. removal of soil nutrients by water
5. B. contains large vacuoles
6. D. volume
7. A. brittle
8. A. bunnies
9. D. manufacture their own food
10. C. nuclear energy
11. C. silicon
12. D. shifting farming
13. B. carbon dioxide and water
14. C. I, III and IV only
15. D. smoke
16. A. handpicking
17. A. cellophane
18. D. break the surface tension
19. C. filtration
20. B. culling
21. C. Dysentery and cholera
22. D. increases with depth
23. B. freezing
24. A. Beans
25. D. tick
26. D. Transistor
27. C. I, II and IV only

- 28. C. determine the types of crop to grow
- 29. D. decolourized
- 30. C. I and III only
- 31. D. water
- 32. A. Bacterium
- 33. B. III only
- 34. B. electric current
- 35. B. carbon
- 36. D. fertilizer application
- 37. C. trachea and alveoli
- 38. C. increase the flow of current in the supply chain
- 39. B. I and II only
- 40. C. planning function

JUNE 2014

INTEGRATED SCIENCE 2

ESSAY

1 ¼ hours

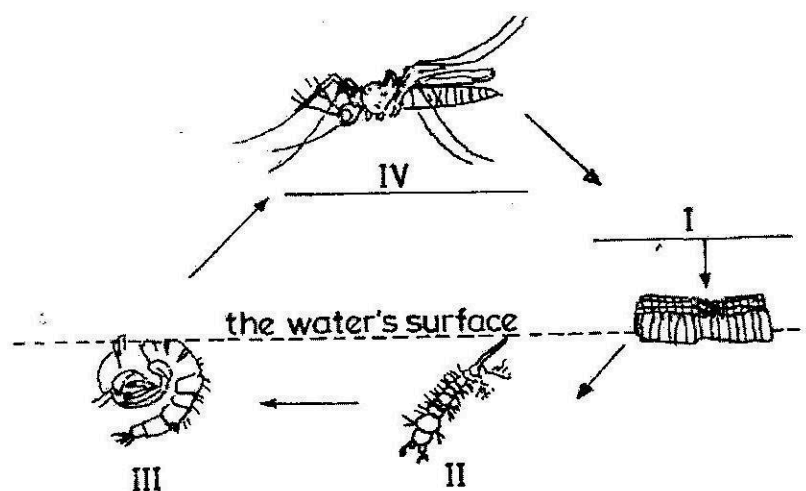
PART I

[40 marks]

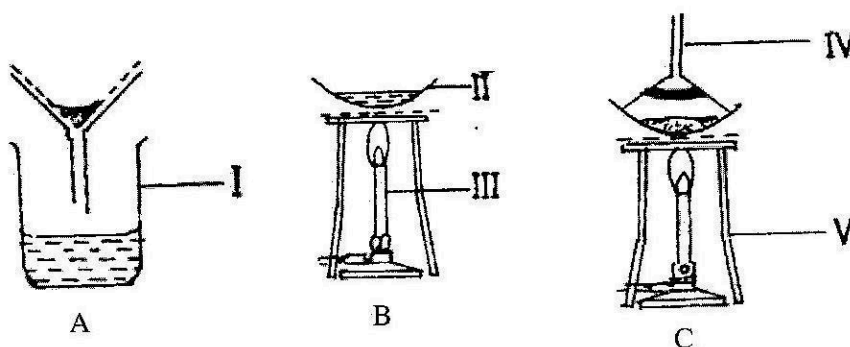
Answer **all** of Question 1

1. (a) The diagrams below represent the stages in the life cycle of a mosquito

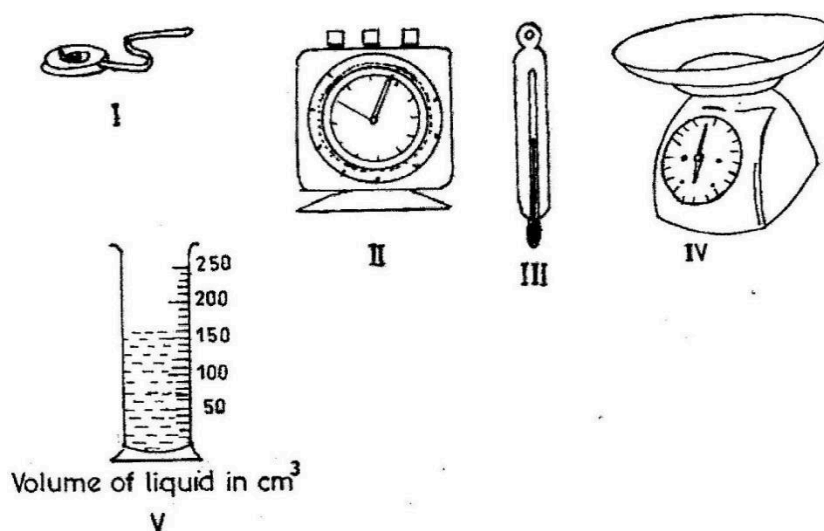
Study the diagrams carefully and answer the questions that follow



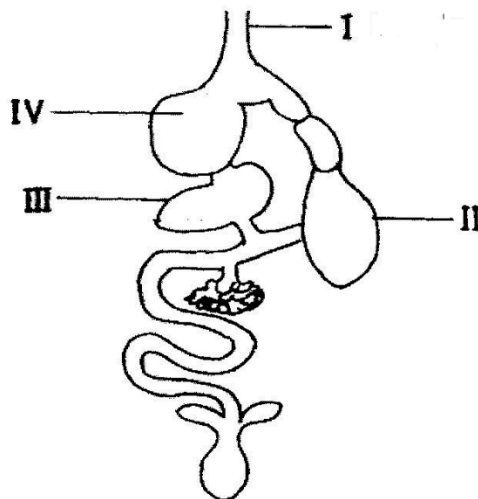
- (i) Name **each** of the stages labeled **I, II, III** and **IV**
- (ii) State how stage **II** obtains oxygen
- (iii) State **two** methods of controlling **each** of the stages labeled **III** and **IV**
- (b) The diagrams below are different laboratory set-ups used in the separation of mixtures.
Study the diagrams carefully and answer the questions that follow



- (i) Name **each** of the parts labeled **I, II, III, IV** and **V**.
 - (ii) Name the separation method represented by **each** diagram.
 - (iii) Which of the set-ups is used to obtain clear water from muddy water?
 - (iv) Which of the set-ups is used to obtain salt from salt solution?
- (c) The diagrams below show some instruments used in the laboratory.
Study the diagrams carefully and answer the questions that follow



- (i) Identify **each** of the instruments labeled **I, II, III, IV** and **V**
 - (ii) State **one** use of **each** of the instruments labeled **I, II, III** and **IV**
 - (iii) Read and record the volume of the liquid in the instrument labeled **V**
- (d) The diagram below shows the digestive system of a class of farm animals.
Study the diagrams carefully and answer the questions that follow



- (i) Name **each** of the parts labeled **I, II, III** and **IV**
- (ii) State **one** function **each** of the parts labeled **II** and **IV**

- (iii) Name **two** farm animals that possess this type of digestive system.
- (iv) Mention **two** diseases which affect this class of farm animals.

[10 marks]

PART II

[60 marks]

Answer **four** questions only from this part.

2. (a) (i) Name the **two** elements that combine to form water.
(ii) Write a balanced chemical equation to show how the water is formed from the named elements
- (b) State **two** ways of maintaining a balance in an ecosystem.
- (c) (i) What is a *fertile soil*?
(ii) State **two** factors that cause loss of soil fertility.
- (d) Classify the following items as *magnetic* or *non-magnetic* substance:
wood, steel blade, rubber and glass jar.
3. (a) (i) What is *germination of seed*?
(ii) State **two** conditions necessary for the germination of seed.
- (b) State **four** methods used in identifying farm animals
- (c) Explain why it is easier to cut a piece of yam with a sharp knife than with a blunt knife
- (d) State **three** differences between a *metal* and a *non-metal*.
4. (a) (i) What is *debeaking*?
(ii) Give two reasons why debeaking in poultry birds is important.
- (b) (i) A steel needle carefully placed on the surface of water floats. What type of force made the steel needle to float?
(ii) Name **three** substances that could be added to the water to make the steel needle to sink.
- (c) (i) Explain why gold is preferred to iron in the making of jewelleryes.
(ii) State **one** way of preventing rusting.
- (d) (i) State **two** elements of climate
(ii) Name the equipment used to measure **each** of the elements stated in (i) above.
5. (a) (i) What is *refraction of light*?

- (ii) Sketch a diagram to show the path of a light ray when it travels from air to glass.
- (b) Explain why it is difficult to separate iron and sulphur mixture after strong heating.
- (c) (i) Give **two** example of digestive enzymes produced in humans.
(ii) For **each** of the enzymes given in (i), name the part of the human body where the enzyme is produced.
- (d) List **four** methods of applying fertilizers to crops.
6. (a) Consider the substance listed below:
carbon dioxide, gold, bronze, iron, oxygen and ink
- From the list, select the substance that:
- (i) supports burning
(ii) is used as jewellery;
(iii) is used for making statues
- (b) (i) Name **two** diseases associated with the circulatory system of humans.
(ii) State **one** way of preventing **each** of the diseases named in (i)
- (c) Give two examples of **each** of:
(i) **major** plant nutrients;
(ii) **minor** plant nutrients.
- (d) (i) State **two** properties of a good thermometric liquid.
(ii) Give **two** examples of a good thermometric liquid.

END OF ESSAY TEST

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INTEGRATED SCIENCE 2

ESSAY SOLUTIONS

1. (a)

(i) Name of each stage

- I. Egg
- II. Larva
- III. Pupa
- IV. Adult / Imago

(ii) How stage **II** obtains oxygen

The larva comes to the surface of the water body to obtain oxygen from the air through a structure called the siphon.

(iii) Methods of controlling **each** of the stages labeled **III** and **IV**

Controlling stage III

- Adding oil to cover the water surface
- Introduction of fish into the water body
- Spraying the water body with pesticides
- Adding kerosene to cover the water surface

Controlling stage IV

- The use of lethal ovitraps
- The use of mosquito spray / insecticide
- The use of mosquito coil
- Clearing mosquito breeding grounds such as choked gutters, stagnant pools of water, etc

(b)

(i) Name of the part labeled

- I. Beaker
- II. Evaporating disc
- III. Candle
- IV. Inverted funnel
- V. Tripod stand

(ii) Name the separation method represented by **each** diagram.

A- Filtration

B- Evaporation

C- sublimation

- (iii) The set-up used to obtain clear water from muddy water

Set up A

- (iv) The set-up used to obtain salt from salt solution?

Set-up B

(c)

- (i) Identification of the instruments labeled **I, II, III, IV** and **V**

- I. Tape measure
- II. stop clock
- III. Thermometer
- IV. Weighing scale/ Top pan balance
- V. Measuring cylinder

- (ii) State **one** use of **each** of the instruments labeled **I, II, III** and **IV**

- I. to measure length of materials
- II. to measure time
- III. to measure temperature
- IV. to measure the mass of materials
- V. to measure the volumes of liquid substances

- (iii) Read and record the volume of the liquid in the instrument labeled **V**

Volume of liquid = 160 cm³

(d)

- (i) Name **each** of the parts labeled **I, II, III** and **IV**

- I. - Gullet
- II. - Gizzard
- III. - Liver
- IV. - Crop

- (ii) State **one** function **each** of the parts labeled **II** and **IV**

- I. - used to grind food
- II. - used to store food temporarily

- (iii) Name **two** farm animals that possess this type of digestive system.

Turkey, fowl, duck, ostrich, geese, guinea fowl.

- (iv) Mention **two** diseases which affect this class of farm animals.
Coccidiosis, fowl typhoid, fowl pox, newcastle disease, pneumonia.

PART II
[60 marks]

2. (a) (i) Name the **two** elements that combine to form water.

Hydrogen and oxygen

- (ii) Write a balanced chemical equation to show how the water is formed from the named elements



- (b) State **two** ways of maintaining a balance in an ecosystem.

- Stopping indiscriminate felling of trees
- By enforcing environmental protection laws; United Nations resolutions on release of poisonous gases should be adhered to.
- Activities of mining industries should be strictly monitored.
- Poaching of animals for their parts should be stopped

- (c) (i) What is a *fertile soil*?

Soil that has the ability to supply the required nutrients needed for plant growth

- (ii) State **two** factors that cause loss of soil fertility.

- Soil erosion,
- leaching,
- excessive irrigation,
- over cropping,
- surface compacting.

- (d) Classify the following items as *magnetic* or *non-magnetic* substance:
wood, steel blade, rubber and glass jar.

Magnetic substance - steel blade

Non-magnetic substance - wood, rubber and glass jar.

3. (a) (i) What is *germination of seed*?

The process by which a viable seed grows/develops into a seedling.

- (ii) State **two** conditions necessary for the germination of seed.

- Presence of air
- Presence of water
- Viable seed

- Optimum temperature

(b) State **four** methods used in identifying farm animals

Tagging, tattooing, branding, tonging, ear notching

(c) Explain why it is easier to cut a piece of yam with a sharp knife than with a blunt knife

The cutting edge of a sharp knife has very small surface area so requires smaller force to yield the pressure needed to cut the yam - making cutting easy, but the cutting edge of a blunt knife has a relatively larger surface area so it needs a larger force to yield the pressure needed to cut the yam.

(d) State **three** differences between a *metal* and a *non-metal*.

Metals	Non-metals
Have high melting point	Have low melting point
Are lustrous	Are not lustrous
Are malleable	Are not malleable
Have high density	Have low density
Are ductile	Are brittle
Are good conductors of heat and electric current	Are poor conductors of heat and electric current

4. (a) (i) What is *debeaking*?

The process by which about half the beak of a bird is removed

or

The process of removing the upper part of the beak of a bird

(ii) Give **two** reasons why debeaking in poultry birds is important.

- To prevent wasting of food
- To prevent egg eating
- To prevent vent pecking
- To prevent injuring other birds

(b) (i) A steel needle carefully placed on the surface of water floats. What type of force made the steel needle to float?

Surface tension

(ii) Name **three** substances that could be added to the water to make the steel needle to sink.

Oil, detergent, grease, kerosene, soap

(c) (i) Explain why gold is preferred to iron in the making of jewellery.

It does not react with substances like water and oxygen.

It does not rust
It is very malleable

- (ii) State **one** way of preventing rusting.
- Applying oil to the surface of the metal
 - Galvanizing the metal
 - Keeping the metal inside a desiccator
 - Alloying the metal

- (d) (i) State **two** elements of climate

Temperature,
rainfall,
relative humidity,
light intensity,
wind speed,
wind direction,
atmospheric pressure

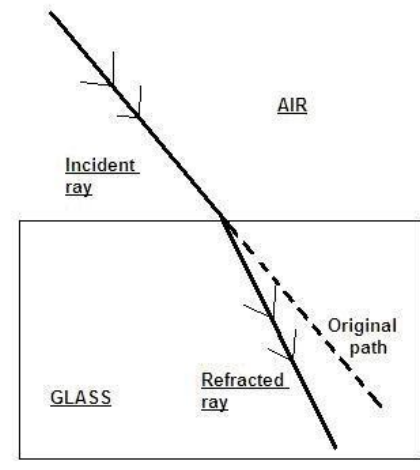
- (ii) Name the equipment used to measure **each** of the elements stated in (i) above.

<u>ELEMENT</u>	<u>EQUIPMENT</u>
Temperature	Thermometer
rainfall,	rain gauge
relative humidity,	hygrometer
light intensity,	photometer
wind speed,	wind vane
wind direction,	anemometer
atmospheric pressure	barometer

5. (a) (i) What is *refraction of light*?

The bending of light rays as it travels from an optically less dense medium to an optically more dense medium

- (ii) Sketch a diagram to show the path of a light ray when it travels from air to glass.



- (b) Explain why it is difficult to separate iron and sulphur mixture after strong heating.
 This is because after strong heating, the iron and sulphur react to form iron (II) sulphide which cannot be separated by physical means

- (c) (i) Give **two** example of digestive enzymes produced in humans.

Salivary amylase,
 pepsin,
 renin,
 lipase,
 trypsin,
 pancreatic amylase,
 maltase

- (ii) For **each** of the enzymes given in (i), name the part of the human body where the enzyme is produced.

<u>ENZYME</u>	<u>PART WHERE ENZYME IS PRODUCED</u>
Salivary amylase	Mouth
pepsin,	stomach
rennin	stomach
lipase	pancreas
trypsin	pancreas
pancreatic amylase	pancreas
maltase	small intestine

- (d) List **four** methods of applying fertilizers to crops.

Drilling, broadcasting, side dressing, top dressing, ringing,

6. (a) Consider the substance listed below:

carbon dioxide, gold, bronze, iron, oxygen and ink

From the list, select the substance that:

- (i) supports burning - oxygen

- (ii) is used as jewellery; - gold
- (iii) is used for making statues - bronze
- (b) (i) Name **two** diseases associated with the circulatory system of humans.
Arteriosclerosis, coronary thrombosis, heart cancer, leukemia, high blood pressure, piles, varicose vein
- (ii) State **one** way of preventing **each** of the diseases named in (i)
- Arteriosclerosis-
- regular exercising of the body
 - avoid smoking
 - low fat intake
- Piles-
- intake a lot of water
 - eat a lot of vegetables and fruits
- High blood pressure-
- regular exercising of the body
 - low salt intake
 - low fat intake
- Varicose vein- surgical removal of vein
- (c) Give two examples of **each** of:
- (i) **major** plant nutrients;
Nitrogen, phosphorus, sulphur, potassium, calcium, magnesium.
- (ii) **minor** plant nutrients.
Chlorine, iron, fluoride, manganese, molybdenum
- (d) (i) State **two** properties of a good thermometric liquid.
- Remains a liquid within a wide temperature range
 - It must not wet glass
 - Expands uniformly with a rise in temperature
 - It must not vaporize easily
- (ii) Give **two** examples of a good thermometric liquid.
Mercury and alcohol

END OF ESSAY TEST