



**THE WEST AFRICAN EXAMINATIONS
COUNCIL, ACCRA**

**BASIC EDUCATION CERTIFICATE
EXAMINATION FOR SCHOOL
CANDIDATES, 2018**

INTEGRATED SCIENCE

FINAL MARKING SCHEME

JUNE 2018 BASIC EDUCATION CERTIFICATE EXAMINATION

FINAL MARKING SCHEME INTEGRATED SCIENCE 2

Section A

Answer all the questions

Question 1

- (a) (i) Identification of fish
Tilapia / Bony fish

1 mark
Correct spelling,

- (ii) Names of labelled parts

- I - mouth
- II - operculum / gill cover
- IV - scales / scale
- V - lateral line

Correct spelling to score
4 x 1 = 4 marks

- (iii) Habitat

- fresh water / river
- pond / fish pond
- brackish water / lagoon
- Lake

Correct spelling to score
Any correctly named fresh water body
Any 1 x 1 = 1 mark

- (iv) Adaptation of labelled parts

- III - used for movement / swimming
- pitching

Any 1 x 2 = 2 marks

- VI - for (wide) vision / seeing

2 marks
[4 marks]

(b) (i) Representation of diagram

- Soil profile

1 mark

(ii) Names of labelled parts

I - Top soil / humus

II - Sub-soil

III - weathered material / rock

IV - parent / (unweathered) rock / rock layer / Bedrock

Correct spelling to score

4 x 1 = 4 marks

(iii) (α) I / Top soil / *humus*

1 mark

(β) I / Top soil / *humus*

1 mark

(γ) { II / Subsoil

{ III / Weathered material

{ IV / Parent rock / Bedrock / rock / rock layer

1 mark

(iv) Effect of heavy rainfall on I

- leaching

- erosion

correct spelling to score.

Any 1 x 1 = 1 mark

(c) (i) Names of labelled parts

I - cell

II - key / switch

IV - (Standard) resistor

VI - variable resistor / rheostat / resistance box

Correct spelling to score

4 x 1 = 4 marks

(ii) Energy transformation

(α) chemical to electrical

2 marks or zero

(β) electrical to heat energy

2 marks or zero

Accept → or — for 'to'.

(iii) S.I. units

(α) III - ampere(s) / A
(β) V - volt(s) / V

1 mark
1 mark

(iv) Functions of part labelled VI

- used to control current
- to vary current
regulate

Any 1 x 1 = 1 mark

(d) (i) Identification of solutions

(α) Hydrochloric acid – turns blue litmus paper to red (2)

[2 marks] or zero

(β) Sodium hydroxide – turns red litmus paper to blue (2)

[2 marks] or zero

(ii) Type of reaction that occurred

Neutralization (reaction)

Correct Spelling

1 mark

(iii) Type of solution formed

Salt / Neutral / sodium chloride (solution)

1 mark

(iv) Observation

- Both red and blue litmus papers would not change colour / there is no colour change / no effect on both red and blue litmus paper

OR

- No colour change for blue litmus paper
- No colour change for red litmus paper

1 mark

1 mark

2 x 1 mark = 2 marks

(v) How the solid portion could be obtained

Pour the resulting solution into a suitable container (1) / allow to dry / heat to dryness / evaporate (1)

[2 marks]

SECTION B

Answer four questions only

Question 2

(a) (i) An ion

Is an atom / group of bonded atoms (1) that has lost / gained electron(s) (1)

OR A charged atom / group of bonded atoms (2)

[2 marks]

(ii) Methods of softening hard water

- boiling
- distillation
- addition of washing soda / Na_2CO_3 / sodium carbonate
- use of ion exchange resin / deionization

Any 2 x 1 = 2 marks

[4 marks]

(b) (i) Difference between pests and parasites

Pest is any organism which causes damage to crops / animals (beneficial to man) while a parasite is a living organism which lives on the surface / inside the body of another organism / host and gets its food from it and in so doing causing harm to the host.

2 marks or zero

(ii) Examples of pests and parasite

Pests

- (α)
- bed bugs
 - cockroaches
 - fleas
 - house flies
 - moths
 - etc

Any 1 x 1 = 1 mark

Parasites

- (β)
- protozoa
 - worms
 - arthropods (insects)
 - ticks
 - etc

} accepting any correctly named examples

Any 1 x 1 = 1 mark

(c) (i) Work

- When a force moves a body through a distance (1) in the direction of the force (1)
- Is the product of force and the distance moved (1) in the direction of the force (1)

[2 marks]

(ii) Calculation of work done

$$\begin{aligned}\text{Work done} &= \text{force} \times \text{distance} & (1) \\ &= 10 \times 5.2 & (1) \\ &= 52 \text{ joules / J} & (1)\end{aligned}$$

[3 marks]

(-½ for wrong unit / no unit)

(d) Diseases of the circulatory system in humans

- high blood pressure / hypertension
- low blood pressure / hypotension
- Arteriosclerosis
- Haemorrhoids / piles
- leukaemia
- etc

Correct spelling to score
Any 2 x 1 = 2 marks

Question 3

(a) (i) Malnutrition

- Is a condition that occurs when a person (1) is not obtaining enough nutrients (1)
- is a condition that results from eating a diet in which nutrients are either not enough / are too much (1) such that the diet causes health problems (1).
- lack of proper nutrition (1), caused by not having enough to eat / not eating enough of the right things / being unable to use the food that one eats (1)
- malnutrition is a condition which occurs when there is a deficiency of certain vital nutrients (1) in a person's diet (1).
- inability to obtain a balanced diet (1) and therefore lack essential food nutrients (1)

[2 marks]

(ii) Symptoms of deficiency diseases

- (α) Scurvy:
- bruising
 - bleeding gums
 - weakness
 - fatigue
 - rashes

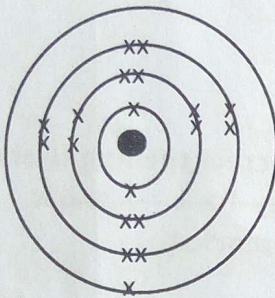
Correct spelling to score

Any 1 x 1 = 1 mark

- (β) rickets:
- delayed growth
 - bow legs / poor bone formation
 - pain in the spine

Any 1 x 1 = 1 mark

(b) Diagram of potassium atom



Correct diagram:

- presence of nucleus (1 mark) N = 1
- four shells (1 mark) S = correct no. of shells (1)
- 2, 8, 8, 1 distribution (2 marks) E = electron distribution (2)

**Correct diagram and correct distribution of electrons
[4 marks]**

(c) (i) Definition of potential energy

Is the energy possessed by a body by virtue of its position (relative to others)

[2 marks] or zero

(ii) Calculation of kinetic energy

$$\begin{aligned} \text{K.E} &= \frac{1}{2} mv^2 \text{ (1)} \\ &= \frac{1}{2} \times 10 \times (2 \times 2) \text{ (1)} \\ &= 20 \text{ joules / J (1)} \end{aligned}$$

3 marks

(-½ for wrong unit / no unit)

(d) Examples of nutrients

(i) Macro nutrients

- Nitrogen / N
- Phosphorus / P
- Potassium / K
- Calcium / Ca
- Magnesium / Mg
- Sodium / Na

Correct spelling to score
Any 1 x 1 = 1 mark

(i) Micro nutrients

- Copper / Cu
- Zinc / Zn
- Molybdenum / Mo
- Iron / Fe
- Boron / B
- Cobalt / Co

Correct spelling to score
Any 1 x 1 = 1 mark
[2 marks]

Question 4

- (a) (i) Hazard is a danger / risk (1) that could result in physical harm to people / damage to property (1). *OR*
Is any source of potential damage / harm / adverse health effect (1) on something / someone (1).

Any 1 x 2 = 2 marks

(ii) Precautions against hazard

- wearing protective clothing / boots / goggles
- routine maintenance of equipment
- closing all taps before leaving the laboratory
- switching off all electrical points
- mounting hazard signs of dos and don'ts in the laboratory / working area etc.

etc.

Any 2 x 1 = 2 marks

1(b)

Osmosis	Diffusion
- refers to the movement of water molecules <i>only</i>	- movement of any chemical / substance <i>/Particle</i>
- moves across semi-permeable membrane	- semi-permeable membrane not required
- from dilute solution to concentrated solution	- from concentrated solution to dilute solution
- occurs in liquids	- occurs in both liquids and gases <i>/fluids</i>

Any 3 x 1 = 3 marks

(c) (i) Weather

- atmospheric conditions at a place (1) over a short duration of time (1)
- It is the state of the atmosphere / environment (1) describing the day to day temperature / humidity / cloud cover / air pressure / wind / precipitation activity (1) **OR**
- Is the state of the atmosphere (1) describing the degree to which it is hot or cold / wet or dry, calm or stormy (1) **OR**
- day to day conditions / changes (1) of the atmosphere / environment (1)

2 marks

(ii) Difference between weather and season

Weather	Season
- varies with time / daily / few hours	- lasts for about 3 to 4 months
- caused by geographic Reasons / atmospheric condition	- is caused by the revolution of the earth
- weather is a temporary / short term phenomenon	- season is a long term phenomenon
- covers relatively small area	- covers large area
- does not influence plant / animal habitat	- influence plant / animal habitat
- not influenced by distance of the sun	- influenced by distance from sun
- measurable	- immeasurable / not measured

Any 2 x 1 = 2 marks

[4 marks]

(d) (i) Fertile soil

- Is a soil that has an abundance of plant nutrients / minerals organic matter (1) to support plant growth (1). *OR*
- it contains all the major nutrients for basic plant nutrition (1) as well as other to support plant growth (1) *OR*
- is a soil which is able to provide all essential plant nutrients in available forms and in a suitable balance (1) to support plant growth (1).

Any 1 x 2 = 2 marks

(ii) Causes of loss of soil fertility

- loss of top soil by erosion
- nutrient mining / depletion / removal of nutrients by crops
- sand winning / physical degradation of soil / poor soil structure / water logging / compaction etc
- decreased soil bioactivity
- soil acidification / salinization / alkalization
- leaching
- overcropping
- overgrazing
- erosion
- excessive burning / bush burning / wildfires / *burning of bush excessively*
- soil pollution / indiscriminate use of agrochemicals
- inefficient soil management practices
- etc

Any 2 x 1 = 2 marks
[4 marks]

Question 5

(a) (i) Magnetic field

Is a region / area around a magnet / moving electric charge (1) within which the force of magnetism acts / can be felt / experienced (1)

(ii) Methods of making magnets

(2 marks)

- by induction
- by stroking
- by the use of electricity
- hammering / hitting

Any 2 x 1 = 2 marks
[4 marks]

(b) Explanation of teenage pregnancy

do not accept child.

- when a girl (1) under age 20 (1) conceives / takes seed (1)
- is when female / girls (1) under the age of 20 (1) get pregnant (1)
- when a female / girl (1) under the age of 20 (1) engages in sexual activity and becomes pregnant (1) either intentionally / unintentionally

[3 marks]

(c) Formula of the following compounds

- | | | | |
|-------|---------------------|---|-----------------------|
| (i) | Calcium chloride | - | CaCl_2 |
| (ii) | Copper (I) oxide | - | Cu_2O |
| (iii) | Nitrogen (IV) oxide | - | NO_2 |
| (iv) | Ammonia | - | NH_3 |

(Subscripts, capital and small letters must be written correctly to score)

4 x 1 = 4 marks

(d) (i) Physical properties of soil

- texture
- structure
- temperature
- colour
- strength / consistence
- permeability
- water
- air
- porosity
- drainage
- capillarity
- organism

Correct Spelling to Score

Any 3 x 1 = 3 marks

(ii) Texture of clayey soil

It is smooth / slippery / sticky (when wet)

1 mark

[4 marks]

Question 6

(a) (i) Derived quantities

Are quantities which are combination / multiples / ratios (1) of base / fundamental quantities (1)

(2 marks)

(ii) S.I. units of the following quantities

- (α) area - m^2 / square metre
(β) volume - m^3 / cubic metre

not metre square.

(b) (i) Factors necessary for photosynthesis

- sunlight
- chlorophyll
- carbon dioxide
- water

Correct spelling. for same.

Any 2 x 1 = 2 marks

(ii) Functions of the factors

Chlorophyll:- absorbs / traps light

Sunlight:- is to separate the hydrogen and oxygen atoms of water / provides energy

Water:- splits into oxygen, hydrogen ions and electrons to replace the lost electrons / raw material / combines with CO_2 to produce food

Carbon dioxide:- Raw material / used in splitting water / is reduced to sugar

2 x 1 = 2 marks

Must correspond with answers in (i) to score

[4 marks]

(c) Explanation of the following terms:

- (i) soft water: Is water that lathers easily / readily (1) with soap (1) / water which Does not contain / contains negligible Ca^{2+} / Mg^{2+} / Ca / Mg ions / salt

[2 marks]

- (ii) hard water: Is water that does not lather easily (1) with soap (1) / water which contains Ca^{2+} / Mg^{2+} / Ca / Mg ions / salt

2 marks

[4 marks]

(d) Reasons why some seeds are nursed

- some seeds are unable to withstand adverse weather conditions
- tiny seeds / provides favourable growth conditions
- better protection / care for seedlings (which are delicate)
- enables selection of healthy seedlings
- some seeds need special treatment to enhance germination / better germination
- eliminates problems of unfavourable soil conditions
- easy control of weeds
- reduces field management cost
- improves crop growth uniformity
- nursed seeds provide higher yield

Any 3 x 1 = 3 marks