EXAMINATIONS COUNCIL OF ESWATINI

Junior Certificate Examination

Science **414/02**

PAPER 2 **2019**

MARK SCHEME

{414/02}

Confidential

1 **(a)** metre rule; accept tape measure [1]

(b) 35 – 10;

25 seconds; [2]

(c) 0.4 m; seen any where

S = d/t / 0.4/25;

= 0.016; [3]

2 **(a)** heat solution + to evaporate;
condense;
water collected as distillate;
salt remains as residue;
distillation; seen anywhere [max 3]

OR

labelled diagram of distillation apparatus earns full marks
all apparatus included;
apparatus labelled i.e. Bunsen burner, (distillation) flask, condenser, correct collecting vessel;
residue /salt + distillate/ water;

(b) can be separated by physical methods/ filtration/ distillation/ crystallisation/ evaporation/ separating funnel/ magnetism/ chromatography;
composition is not fixed/ variable/ aw;
reversible;
no new substance formed;
energy not involved/ taken in/ absorbed / released; any two, [max. 2]

3 **(a)** shiny/ lustrous;
malleable;
sonorous;
conduct heat/ electricity;
ductile/ ;
high melting and boiling point; any two [max. 2]

(b) **F;** [1]

(c) is insoluble in water;
less dense than water; [2]

4 **(a)(i)** palisade cell; [1]

(ii) nucleus; [1]

(iii) site for photosynthesis; [1]

(b) contains a group of tissues/xylem and phloem/ epidermis;
that perform a certain function/ photosynthesis; [2]

(c) broad;
network of veins; [2]

5 **(a)** heated particles expand;
and become lighter;
lighter particles rise and cold denser particles go down; [3]

(b)(i) vacuum [1]

(ii) no particles;
conduction and convection involves particles; [2]

(c) electrons from the cloth;
are transferred to the ruler; [2]

6 **(a)** **Table 6.1**

steps	description	explanation
Step 1	stirring/ heating	to mix reactants and evenly distribute heat/ to make reaction faster;
step 2	filtration	to remove excess copper(II) oxide;

[4]

(b)

salt	starting materials	
calcium sulfate	calcium	dilute sulfuric acid
potassium chloride	potassium hydroxide	hydrochloric acid

[3]

7 **(a)(i)** sperm duct; [1]

(ii) label line to the testes labelled **F**; A **F** on testes [1]

(b) testosterone; [1]

(c) Tuberculosis/hepatitis B/cervical cancer/meningitis/pneumonia [max. 2]

8 **(a)** **F** repulsion;

G attraction; [2]

(b) at least 2 field lines from each pole;

correct direction of field lines; [2]

(c) magnet gets struck/hammered/AW;

magnetic domains disorganised; [2]

9 **(a)** particles are close together; [1]

(b) diffusion;

particles move from where they are more concentrated (in the kitchen);

to where they are less concentrated (Thabo); [3]

10 **(a)** erector muscle; [1]

(b) collect water (+ salts) from blood capillaries;
water moves up sweat ducts into sweat pores;
forms layer of water on skin;
evaporates using energy from the skin; any three [max. 3]

11 total resistance = 1.5 + 2
= 3.5Ω;
I = V/R
I = 1.5/ 3.5;
= 0.43 A; [3]

SECTION B

12 **(a)** **(i)** v = 35 (cm^3);
M = 75; [2]

(ii) put measuring cylinder on a flat surface;
eye must be level with bottom of meniscus;
[max. 1]

(b) tie stone with string (of negligible volume);
(gentle) lower the stone into the water until it is fully immersed and record volume (as V_2);
volume of stone = $V_2 - V_1$;
measure mass of the stone using a triple beam balance/ electronic balance: a named balance;
divide mass by volume to get the density; [max. 4]

(c) **(i)** suitable scale covering more than half the grid;
all points correctly plotted;; 5 points earn 1 mark
points joined + smooth curve; [4]

(ii) check from the pupils graph at 7cm; [1]

(iii) the closer the plant from the lamp the more bubbles are produced; [1]

(iv) test: introduce a glowing splint into the test tube;
result: glowing splint relights/ rekindles; [2]

(v) to improve accuracy/ to reduce (experimental) errors; [1]

(vi) get a plant with variegated leaves;
destarch the plant;
expose the plant to broad daylight for few hours;
keep temperature/ light intensity/ carbon dioxide concentration constant;
remove the leaves from the plant ;
use iodine solution to test for the presence of starch;
the parts of the leaf that have chlorophyll/ green part turns blue-black; [max. 4]