EXAMINATION COUNCIL OF ESWATINI
Junior Certificate

Science **414/02**

PAPER 2 **2020**

Confidential

MARK SCHEME

{414/02}

MARKS: 40

This question paper consists of **6** printed pages.

GENERAL NOTES

Mark Schemes will use these abbreviations:

- ; separates marking points
- / separates alternatives for a marking
- R reject
- A accept (for answers correctly cued by the question, or
- AW alternative wording (where responses vary more than usual)
- MP mark point- used in guidance notes when referring to numbered marking points
- ORA or reverse argument/reasoning
- OWTTE or words to that effect
- I ignore/irrelevant – this response gains no mark, but any following correct answers can gain marks
- ( ) the word/ phrase in brackets is not required to gain marks but sets context of response for credit. e.g. (waxy) cuticle. Waxy not needed but if it was described as cellulose cuticle then no mark.
- <u>small</u> underlined words- this word only (grammatical variants excepted)
- D, L, T, Q quality of drawing/ labelling/ table / writing as indicated by mark scheme
- max indicates the maximum number of marks that can be given

1 **(a)** **(i)** switch; [1]

(ii) to measure the current flowing in the circuit); [1]

(b) correct symbol;

correct position/ across the bulb; [2]

(c) material that allows flow of electricity;

contain free electrons; [2]

2 **(a)** malleable/ malleability; [1]

(b) **(i)** water / moisture and oxygen / air;
reacts with iron;
to produce iron oxide; [3]

(ii) a new substance formed/ irreversible/colour change; **R** gas can be produced/heat change [1]

(c) **(i)** adding oxygen (to remove impurities);
adding additives/ carbon, nickel, chromium/ to make steel/ alloy; [2]

(ii) iron (lll) oxide + carbon monoxide;
⟶ Iron + carbon dioxide; [2]

3 **(a)** C – oviduct [1]

D – uterus [1]

E – ovary [1]

(b) gametes [1]

(c) **(i)** shedding or braking down of the inner lining of uterus (uterine wall) and blood comes out of the vagina; OWTTE [1]

(ii) delivery of an egg from the ovary; [1]

(d) HIV attacks and destroys lymphocytes;

Lowers immune system/opportunistic diseases that leads to aids can Develop; [2]

4 **(a)** position correctly marked same distance behind mirror as girl is in front of mirror; [1]

(b) normal shown;

reflected ray + correct direction;

equal angles from normal ($i = r$)**;** [3]

(c)

real image	mirror image
A smaller/ same size/ larger	same
upside down	upright
inverted	laterally inverted
variable	same distance as object
can be formed on a screen	cannot be formed on a screen

Any one [1]

5 **(a)** fried chicken; [1]

(b) **spinach:** provide roughage (assist in digestion)/ provide iron (to make haemoglobin)/ provides calcium; any one [1]

Oranges: provide vitamin C/ essential to heal wounds/keep blood vessel strong/build new skin; any one [1]

(c) **(i)** glucose; [1]

(ii) add iodine solution/drops (to the rice);
a blue-black will indicate the presence of starch; [2]

(iii) digested by salivary amylase;
into maltose; [2]

(d) protein; [1]
fatty acids and glycerol [1]

6 **(a)** downward displacement of water; [1]

(b) slightly soluble in water/ denser than air; [1]

(c) bubble lime water; [1]
turns milky/ chalky/ white precipitate/ cloudy; [1]

(d) it contains two elements carbon and oxygen;
which are chemically combined; [2]

(e) does not support combustion; [1]

7 **(a)** transverse: waves whose direction of motion is perpendicular/ at right angles;
to the direction of vibrations/ disturbances;
longitudinal: direction of motion is parallel to/ same direction as/ along;
(the direction of vibrations/ disturbances) [3]

(b) **(i)** 3 cm [1]

(ii) 3 ÷ 5/
0.6; [1]

8 **(a)** particles vibrate/ AW;
about fixed positions; [2]

(b) observation: purple colour spreads throughout the water in the beaker;
explanation: potassium permanganate particles moved from the region of their higher concentration;
to the region of their lower concentration;
reference to diffusion;
reference to concentration gradient; any two [3]

9 **(a)** light; A heat [1]

(b) **(i)** (gravitational) potential energy $\xrightarrow{\text{changes into}}$; R potential energy without arrow or the phrase changes into
kinetic energy; [2]

(ii) energy is neither created nor destroyed but converted/transferred from one form to another/ energy is conserved;
loss in potential energy is equal to a gain in kinetic energy; AW [2]

10 **(a)** **K**- condenser; [1]

L-evaporating dish; [1]

(b) **J**- separates insoluble solid from solvent/ filtration; [1]
M- provides energy that drives electric current/ provides electrical energy; [1]

(c) separates two immiscible liquids/ liquids with different densities; AW
R examples only [1]

(d) tie a small mass with string and suspend on the pin;
mark the position of the string on the card with a line;
suspend card with a different position/ hole and repeat steps above;
where the two lines cross, it's the centre of mass of the card; [4]

(e) reduce the height of the car/ tyres / AW/ widen the base/ width of the car/ tyres; to lower the centre of mass; **A** to lower centre of gravity;
R large/ thick tyres [2]

(f) identify flowers of the same age/size/species;
reference to different colours;
expose both flowers to the same environment where insects can easily identify them;
count the number of insects visiting each flower;
record the number of insects visiting each flower;
reference to specified time/ duration of observation;
repeat to get average/reliability;
flower with the higher number of insects visiting it attracts insects more/ AW; any 5 [5]

(g) **(i)** 47°C $\pm$0.5
28°C $\pm$ 0.5; [1]
19°C; [1]

(ii) bulb must not touch the sides and base of container; [1]
eyes must be level with bottom of the meniscus; [1]
R taking reading while thermometer is still in solution