

**CAMBRIDGE INTERNATIONAL EXAMINATIONS**

Cambridge Ordinary Level

## **MARK SCHEME for the October/November 2014 series**

### **5129 COMBINED SCIENCE**

**5129/22**

Paper 2 (Theory), maximum raw mark 100

This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began, which would have considered the acceptability of alternative answers.

Mark schemes should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

Cambridge will not enter into discussions about these mark schemes.

Cambridge is publishing the mark schemes for the October/November 2014 series for most Cambridge IGCSE<sup>®</sup>, Cambridge International A and AS Level components and some Cambridge O Level components.

® IGCSE is the registered trademark of Cambridge International Examinations.

Page 2	Mark Scheme	Syllabus	Paper
	Cambridge O Level – October/November 2014	5129	22

- 1 Energy ;  
Aerobic ;  
Water ;  
Carbon dioxide ;  
Lactic acid ;  
Muscle ;
- } either order (accept correct formulae)
- [6]
- 2 (a) Four points correctly drawn ( $\frac{1}{2}$  square tolerance) ;  
Straight line through the points ;
- [2]
- (b) (i) 240 ; (ecf from graph)
- (ii) 24000 ; (ecf from (b)(i))
- [2]
- (c) Limewater ; (incorrect test = 0 mark)  
Goes milky / cloudy / white precipitate ;
- [2]
- 3 (a) (i) Not a straight line / line is a curve ;
- [1]
- (ii) 0 ;
- [1]
- (iii) Time 0.4 s and  $v = 2.0 \text{ m/s}$  ;  
 $s = v \times t$  or  $0.4 \times 2.0$  ;  
0.8 ;
- [3]
- (b) (i)  $F = m \times a$  or  $0.03 \times 8$  ;  
0.24 ;
- [2]
- (ii)  $D = m/v$  or  $0.030/8 \times 10^{-6}$  ;  
3750 ;  
 $\text{kg/m}^3$  ;
- [3]
- (Accept a numerical answer with consistent unit –  $3.75 \text{ g/cm}^3 = 3$  marks)
- 4 (a) Urea / other amino acids ;  
Glycogen / fats ;
- [2]
- (b) Alcohol / ethanol ;  
Hormones / a named hormone ;  
Drugs / any named drug ;  
Haemoglobin ;  
Toxic / poisonous chemicals ;
- } any 2
- [2]

Page 3	Mark Scheme	Syllabus	Paper
	Cambridge O Level – October/November 2014	5129	22

- 5 (a) Halogens ; [1]
- (b) Solid ;  
Black ; [2]
- (c) 7 electrons in outer/valency shell ; [1]
- (d) Alkenes ; [1]
- 6 (a) Length = 14.4 ;  
Extension. 1.2, 2.4, 3.6, 4.8 ; [2]
- (b) Spring force = 0.30 ;  
Weight = 0.96 ; [2]
- 7 (a) (i) Osmosis (ignore diffusion) ; [1]
- (ii) Sugar solution more concentrated than cell contents  
Or water concentration in cell is more than in sugar concentration ;  
Water (molecules) move out of the cells ;  
Through the partially permeable membrane ;  
To make concentrations equal ; } any 3 [3]
- (iii) Concentration of cell contents equal to concentration of sugar solution  
Or no further loss of water (from the tissue/ sample)  
Or no further osmosis ; [1]
- (b) 27 (cm<sup>3</sup>) ; [1]
- (c) (i) Has same volume (of cells as first piece) ; (ignore same mass) [1]
- (ii) Has smaller surface area (than first piece) ;  
A calculation of the surface areas (78 cm<sup>3</sup> and 54 cm<sup>3</sup>) ; } any 1 [1]
- 8 (a) 14 ;  
18 ;  
20 ;  
2,8,1 ;  
2,8,8 ; [5]
- (b) (i) Na<sub>2</sub>S ; [1]
- (ii) Ionic ; [1]

Page 4	Mark Scheme	Syllabus	Paper
	Cambridge O Level – October/November 2014	5129	22

- 9 (a) X = potassium hydroxide ;  
 Y = sulfuric acid ;  
 Z = ammonia ;  
 (accept correct formulae for all) [3]
- (b) Neutralisation/exothermic ; [1]
- (c) Fuel (for rockets)/ making margarine / ammonia / Haber process [1]
- 10 (a) (i) Alpha /  $\alpha$  ;  
 (ii) Gamma /  $\gamma$  ; [2]
- (b) 24 ; 100 ; [2]
- 11 (a) Normal correct ; [1]
- (b) First reflection vertical ;  
 Second reflection horizontal ; [2]
- 12 (a) Externally administered substance ;  
 (that) modifies / affects chemical reactions (in the body) ; [2]
- (b) (Powerful) depressant ;  
 Addiction / dependency ;  
 Withdrawal symptoms ;  
 Vein collapse ; } any 3 [3]
- 13 (a) (i) Fractional distillation ; [1]
- (ii) Bitumen ;  
 Kerosene / paraffin ; [2]
- (b) (i) Alkanes ; [1]
- (ii) 13 12 14 ; [1]

Page 5	Mark Scheme	Syllabus	Paper
	Cambridge O Level – October/November 2014	5129	22

- 14 (a) Correct symbol on the circuit ;  
In parallel with variable resistor ; [2]
- (b)  $I = V/R$  or  $0.6/2$  ;  
0.3 ; [2]
- (c) (i) Decreases/less ; [1]
- (ii) Decreases/less ; [1]
- (iii) Increases/more ; [1]
- 15 (a) (i) A – Aorta ;  
B – Pulmonary vein ;  
C – Semi-lunar valve/aortic valve ; [3]
- (ii) (D) Pumps/contracts more strongly/with more force ;  
Raises/higher blood pressure ;  
Propels blood greater distance/further ; } any 1  
(Than E) (Or **stated** converse) [1]
- (b) (i) Platelet/thrombocyte ; [1]
- (ii) (Platelet) produces thrombin ;  
(Soluble) fibrinogen ; } any 2  
Converted to (insoluble) fibrin ;  
Form mesh across wound/ seals wound ; } [2]
- (iii) Take more exercise ;  
Reduce stress levels ;  
Do not smoke (cigarettes) ;  
Eat less meat/food rich in fat/less fat ; } any 3  
Eat more fruit/vegetables/fibre ;  
Reduce weight ;  
Reduce (blood) cholesterol level ; } [3]  
Note: the question asks for a change in lifestyle.
- 16 (a) Oxygen ; [1]
- (b) Nitrogen ; [1]
- (c) Helium ; [1]
- (d) Carbon monoxide ; [1]
- (e) Sulfur dioxide/carbon dioxide ; [1]

Page 6	Mark Scheme	Syllabus	Paper
	Cambridge O Level – October/November 2014	5129	22

- 17 (a) Higher/increase/more positive/more to the right ; [1]
- (b) Reverse polarity (of magnet)/turn magnet round ;  
Reverse motion (of magnet)/pull magnet out ;  
Reverse connection to ammeter ; } any 2 [2]
- 18 (a) Best/good absorber/absorbs heat faster ; [1]
- (b) (i) Increases/more ; [1]
- (ii) Decreases/less ; [1]