

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

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- 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 0.4×2.0 ;
0.8 ;
[3]
- (b) (i) $F = m \times a$ or 0.03×8 ;
0.24 ;
[2]
(ii) $D = m/v$ or $0.030/8 \times 10^{-6}$;
3750 ;
 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]

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- 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^3 ; [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^3 and 54 cm^3) ; } any 1 [1]
- 8 (a) 14 ;
2,8,1 ;
18 ;
20 ;
2,8,8 ; [5]
- (b) (i) Na_2S ; [1]
- (ii) Ionic ; [1]

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- 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 / α ;
(ii) Gamma / γ ; [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]

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- 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 ;
(Than E) (Or **stated** converse) } any 1 [1]
- (b) (i) Platelet/thrombocyte ; [1]
- (ii) (Platelet) produces thrombin ;
(Soluble) fibrinogen ;
Converted to (insoluble) fibrin ;
Form mesh across wound/seals wound ; } any 2 [2]
- (iii) Take more exercise ;
Reduce stress levels ;
Do not smoke (cigarettes) ;
Eat less meat/food rich in fat/less fat ;
Eat more fruit/vegetables/fibre ;
Reduce weight ;
Reduce (blood) cholesterol level ;
Note: the question asks for a change in lifestyle. } any 3 [3]
- 16 (a) Oxygen ; [1]
- (b) Nitrogen ; [1]
- (c) Helium ; [1]
- (d) Carbon monoxide ; [1]
- (e) Sulfur dioxide / carbon dioxide ; [1]

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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]