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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CAMBRIDGE
International Examinations

1 Energy ;
Aerobic ;
Water ; } either order (accept correct formulae)
Carbon dioxide ; }
Lactic acid ;
Muscle ; **[6]**

2 **(a)** Four points correctly drawn (½ 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 m / s ;
$s = v$ x t **or** 0.4 × 2.0 ;
0.8 ; **[3]**

(b) **(i)** $F = m$ x a **or** 0.03 × 8 ;
0.24 ; **[2]**

(ii) $D = m / v$ **or** 0.030 / 8 × 10^{-6} ;
3750 ;
kg / m^3 ; **[3]**

(Accept a numerical answer with consistent unit – 3.75 g / cm^3 = 3 marks)

4 **(a)** Urea / **<u>other</u>** amino acids ;
Glycogen / fats ; **[2]**

(b) Alcohol / ethanol ;
Hormones / a named hormone ;
Drugs / any named drug ; } any 2
Haemoglobin ;
Toxic / poisonous chemicals ; **[2]**

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)**

18 ;	14 ;	2,8,1 ;
	20 ;	2,8,8 ;

[5]

(b) **(i)** Na_2S ; **[1]**

(ii) Ionic ; **[1]**

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) 100 ;
24 ; **[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)** <u>Fractional</u> distillation ; **[1]**

(ii) Bitumen ;
Kerosene / paraffin ; **[2]**

(b) **(i)** Alkanes ; **[1]**

(ii) 13 12 14 ; **[1]**

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 ;
Converted to (insoluble) fibrin ; } any 2
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]**

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]**