

**CAMBRIDGE INTERNATIONAL EXAMINATIONS**

Cambridge Ordinary Level

## **MARK SCHEME for the May/June 2015 series**

### **5129 COMBINED SCIENCES**

**5129/22**

Paper 2 (Theory), maximum raw mark 100

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- 1 (a) U ; [5]
- (b) S ;
- (c) T ;
- (d) Q ;
- (e) P ;
- 2 amylase ; [5]  
 extra-cellular ;  
 absorbed ;  
 glycogen ;  
 liver ;
- 3 (a) (i) 40 ;
- (ii) 7.9 ; or 316/1(a)(i) [2]  
 g/cm<sup>3</sup> ;
- (b) steel is hard magnetic / iron is soft magnetic ;  
 iron loses magnetism easily / steel retains magnetism ;  
 iron easily magnetised / steel difficult to magnetise ;  
 iron is temporary magnet / steel is permanent magnet ; } any 1 [1]
- 4 (a) (i) C<sub>3</sub>H<sub>8</sub> ; [2]  
 (ii) alkane ;
- (b) unsaturated ; [4]  
 colourless ;  
 addition ;  
 monomer ;
- 5 (a) (i) B or E ; [3]  
 (ii) C ;  
 (iii) F ;

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- (b) glucose and oxygen (both in either order) ; [1]
- (c) absorb/trap/capture light ; [2]  
converts (light energy) to chemical energy ;
- (d) carbon dioxide – (through the) stomata ; [2]  
water – root hair cells ;
- 6 (a) (i) 0.2 ; [1]  
(ii) 9 ; [1]
- (b) (i) larger (maximum) voltage ; } any 1  
shorter period / time for one rotation ; }  
frequency increases ; }
- 7 (a)  $Q = It$  or  $I = Q/t$  or  $40/16$  ; [2]  
 $= 2.5$  ;
- (b)  $V = E/It$  or  $20/(2.5 \times 16)$  or  $V = E/Q$  or  $20/40$  ; [2]  
 $= 0.5$  ;
- 8 (a) (i) 52 ; [2]  
(ii) chromium / Cr ;
- (b) (i) 72 ; [2]  
(ii)  $(152 \times 3.6)/72 = 7.6$  ;  
ecf from  $(152 \times 3.6)/b(i)$  ;
- (c) it has lost oxygen ; [1]  
(allow definitions in terms of electrons or oxidation state)
- 9 (a) rate of change of velocity / speed ; } any 1 [2]  
change in velocity / time ; }  
increasing velocity / speed gains 1 mark  
velocity / time gains 1 mark
- (b) 1.6 ; [1]  
(allow 1.2) ;

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- (c) vertical arrow down ; [1]
- 10 (a) combustion of fossil fuels/named fossil fuels ; [2]  
containing sulfur compounds ;  
**OR**  
volcanic activity ;  
from rocks containing sulfur ;
- (b) (i) hydrogen/H<sup>+</sup> ; [1]
- (ii) 2 2 ; [1]
- (iii) sodium carbonate ; } any 2 [2]  
sodium hydrogencarbonate ;  
sodium oxide ;  
do **not** allow sodium
- 11 (a) (expired air) contains more carbon dioxide ; [3]  
(expired air) contains less oxygen ;  
(expired air) contains the same amount of nitrogen ;  
(allow relative numerical values)
- (b) (i) 14.7 ; [1]
- (ii) breathing becomes more rapid/faster ; [2]  
each breath taken is increased in volume/deeper breaths ;
- (iii) more oxygen is required ; } any 2 [2]  
for respiration ;  
to provide more energy ;
- 12 (a)  $F_1d_1 = F_2d_2$  or  $30 \times 16/20$  ; [2]  
= 24 ;
- (b) 14 ; [1]
- (c) weight of measuring cylinder increased ; } any 2 [2]  
creates larger (anti-clockwise) moment ;  
moved to reduce the (anti-clockwise) moment ;  
clockwise and anti-clockwise moments equal ;
- 13 (a) Z ; [1]
- (b) V ; [1]

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- (c) U and X (both); [1]
- (d) W; [1]
- (e)  $YZ_3$ ; [1]
- 14 (a) potential/gravitational/gravitational potential; [1]
- (b)  $F = W/d$  or  $15/2.5$ ; [2]  
 $= 6$ ;
- 15 speed; [3]  
wavelengths;  
reflection;
- 16 liver; [6]  
cell membrane;  
iris (muscles)/circular/radial muscles;  
kidney(s);  
platelet(s);  
gall bladder;
- 17 (a) (protective) layer; [2]  
of (aluminium) oxide;
- (b) aircraft bodies; } any 1 [1]  
food containers/foil; }  
overhead cables; }
- 18 (a) perpendicular to surface at point where ray enters; [1]
- (b) between normal and incident ray; [1]
- (c) from refracted ray parallel to incident ray; [1]
- 19 (a) (i) circle round day 1; [1]  
(ii) any day from day 11 and 17; [1]

(b) chemical / spermicide ;  
 hormonal / (contraceptive) pill ;  
 surgical / vasectomy / sterilisation ;  
 condom / femidom ;  
 diaphragm / inter-uterine device ;

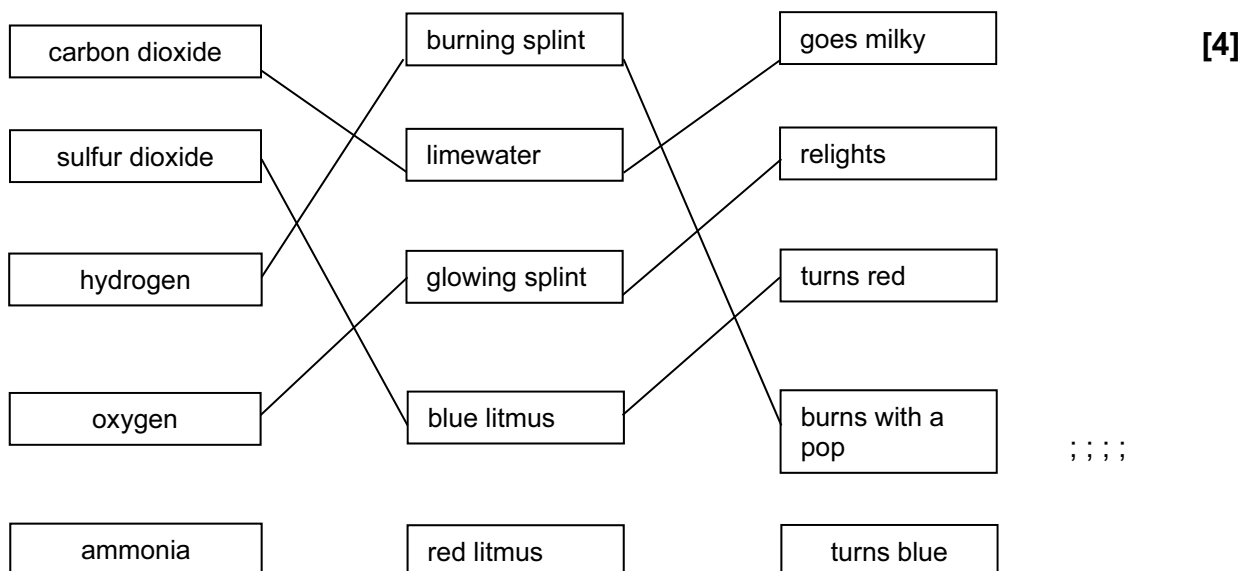
} any 2 [2]

(c) (i) (painless) ulcer ;  
 body rash with fever ;  
 swollen lymph nodes ;  
 insanity ;  
 brain damage ;  
 blindness ;  
 heart disease ;

} any 1 [1]

(ii) penicillin / antibiotics ; [1]

20



21 (a) 144 ; [1]

(b) protons = 2 AND neutrons = 2 ; (both needed) [1]

(c) 4 half-lives ; [2]  
 200 ; ;