

CAMBRIDGE INTERNATIONAL EXAMINATIONS

Cambridge Ordinary Level

MARK SCHEME for the May/June 2015 series

5129 COMBINED SCIENCES

5129/21

Paper 2 (Theory), maximum raw mark 100

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Page 2	Mark Scheme	Syllabus	Paper
	Cambridge O Level – May/June 2015	5129	21

- 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/cm³ ;
- (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) C₃H₈ ; [2]
 (ii) alkane ;
- (b) unsaturated ; [4]
 colourless ;
 addition ;
 monomer ;
- 5 (a) (i) B or E ; [3]
 (ii) C ;
 (iii) F ;

Page 3	Mark Scheme	Syllabus	Paper
	Cambridge O Level – May/June 2015	5129	21

- (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) ;

Page 4	Mark Scheme	Syllabus	Paper
	Cambridge O Level – May/June 2015	5129	21

- (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⁺ ; [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]

Page 5	Mark Scheme	Syllabus	Paper
	Cambridge O Level – May/June 2015	5129	21

- (c) U and X (both); [1]
- (d) W; [1]
- (e) YZ₃; [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; }
food containers/foil; } any 1
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 ;

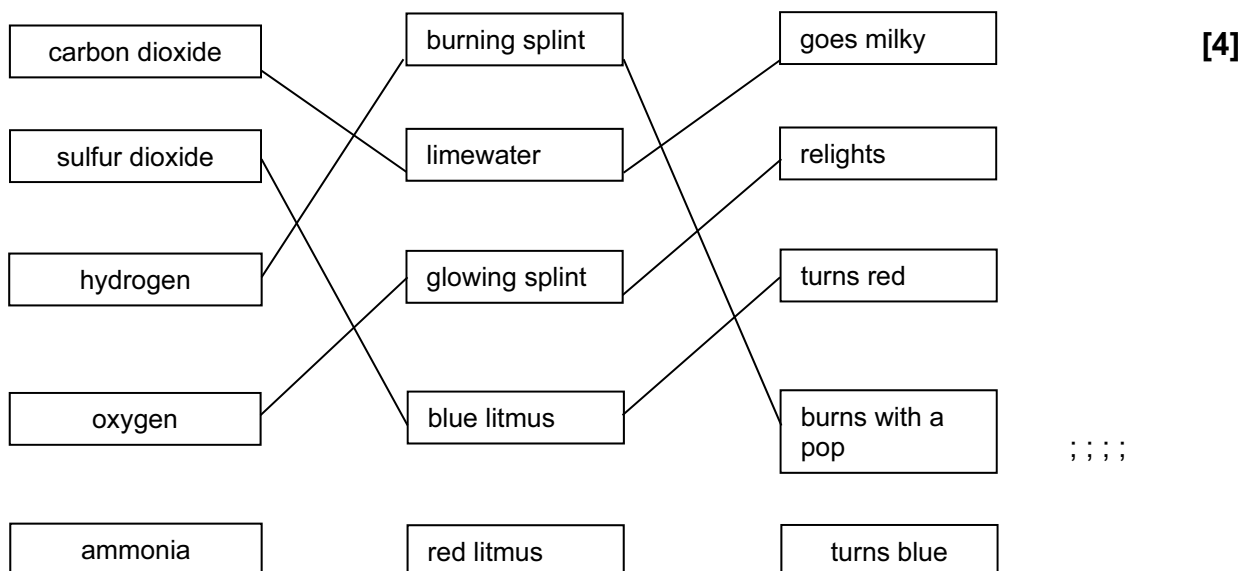
} any 2 [2]

(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 ; ;