

MARK SCHEME for the October/November 2013 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 2013 series for most IGCSE, GCE Advanced Level and Advanced Subsidiary Level components and some Ordinary Level components.

Page 2	Mark Scheme	Syllabus	Paper
	GCE O LEVEL – October/November 2013	5129	22

- 1 plasma
red blood cells
lungs
capillaries
valves [5]
- 2 (a) chlorine (accept correct formula) [1]
- (b) hydrogen/chlorine (accept correct formulae) [1]
- (c) oxygen (accept correct formula) [1]
- (d) nitrogen
hydrogen (accept correct formulae) either order [2]
- 3 (a) 3 [1]
- (b) vertically down [1]
- (c) 0.14 [1]
- 4 (a) 88
allow ecf if working shown for incorrect addition
allow 1 mark for correct addition = 12% [2]
- (b) correct temperature
sterile/hygenic
develops jaw muscles
promotes bonding (between mother and baby
always available/no preparation time
contains antibodies/immunity against infection
ignore cost/convenience } any 3 [3]
- 5 (a) (i) D
(ii) C
(iii) F [3]
- (b) C and F (both in ether order) [1]
- (c) B [1]

Page 3	Mark Scheme	Syllabus	Paper
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6 (a) $W = F \times s$ or $120\,000 \times 50$ or mgh [1]
 $= 6\,000\,000$ [1]
 (allow 6000 kJ with correct unit)

(b) $P = E/t$ or $6\,000\,000/120$ or (a)/120 [1]
 $= 50\,000$ [1]
 W (unit independent) [1]
 3 000 000 W scores 2, a/2 correctly calculated scores 1 mark

7 (a) volume/density
 length
 pressure
 e.m.f./voltage
 colour
 resistance } any 2 [2]

(b) ability to read smaller changes in temperature [1]
 difference between highest and lowest reading [1]

8

aerobic respiration	anaerobic respiration
x	✓
✓	x
✓	✓
✓	✓
✓	x

[5]

9 (a) (i) C_6H_{14}
 (ii) 95–100 [2]

(b) same general formula
 similar chemical properties
 show a trend in physical properties } any 1 [2]

(c) (i) structure of ethane [1]

(ii) carbon dioxide
 water/steam (accept correct formulae) either order [2]

Page 4	Mark Scheme	Syllabus	Paper
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- 10 (a) up and down [1]
- (b) maximum displacement or distance from rest to peak/trough [1]
- (c) $f = v/\lambda$ or 9.6/7.2 [1]
= 1.33 (allow 1.3) [1]
Hz (unit independent) [1]
- 11 (a) A = copper sulfate
B = water
C = hydrogen (accept correct formulae) [3]
- (b) acid + hydroxide (any indication such as B, 2nd, hydroxide etc.) [1]
- (c) (i) 0–3 [1]
(ii) H^+ and SO_4^{2-} (both required) [1]
- 12 (a) B = nucleus [1]
E = cytoplasm [1]
F = (cell) (plasma) membrane [1]
three letters correct, but no names correct, allow 1 mark
- (b) absence of chloroplasts/chlorophyll [1]
root hair cell receives no light/is underground
chloroplasts could not be used/cell cannot carry out photosynthesis [2]
cell is T shaped/different shape (accept sketches showing shape) [1]
large surface area (per volume)
for absorption of water/minerals/ions
Note: large surface area means different shape = 1 mark
explanation is dependent on the difference being stated [2]
- 13 (a) no contact between electrical parts and outer casing
or outer casing cannot become live [1]
- (b) (i) plastic is a poor electrical/thermal conductor or good insulator
accept the converse for metal [1]
(ii) water good electrical conductor [1]
- (c) thermal/heat }
kinetic } any 2
sound } [2]

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- 14 (a) (i) E
(ii) D
(iii) A [3]
- (b) (i) chlorophyll [1]
(ii) chemical (energy) [1]
- (c) transpiration [1]
- 15 (a) 8 electrons on outer shell of Si
4 bonding pairs [2]
- (b) 32 8 [2]
3.2 0.8 (divide by 10) [1]
0.4 (divide by 8) [1]
- 16 (a) 146 [1]
- (b) 90
144 (accept (a)–2) [2]
- (c) 13.5/4.5 or 3 half-lives [1]
 $1/8 \times 10\,000 = 1250$ [1]
- (d) gamma/ γ [1]
- 17 (a) (i) discharge from penis }
red/swollen end of penis } any 1
tender/swollen testicles } [1]
- (ii) vaginal discharge }
painful intercourse } any 1
pain in lower abdomen/uterine area } [1]
- (b) antibiotics (accept names antibiotic) [1]

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- 18 (a) coating the iron (do not accept plating or electroplating) with zinc [2]
- (b) painting/greasing/plastic coating/electroplating/sacrificial protection [1]
- (c) oxygen water (accept correct formulae) [2]
- 19 (a) negative/-/-1
- (b) coulombs/C
- (c) current (ignore A/ampere) [3]
- 20 (a) X-rays/gamma rays [1]
- (b) sound/sonic/p-waves [1]