

CAMBRIDGE INTERNATIONAL EXAMINATIONS**Cambridge International General Certificate of Secondary Education****MARK SCHEME for the October/November 2015 series****0653 COMBINED SCIENCE****0653/21**

Paper 2 (Core Theory), maximum raw mark 80

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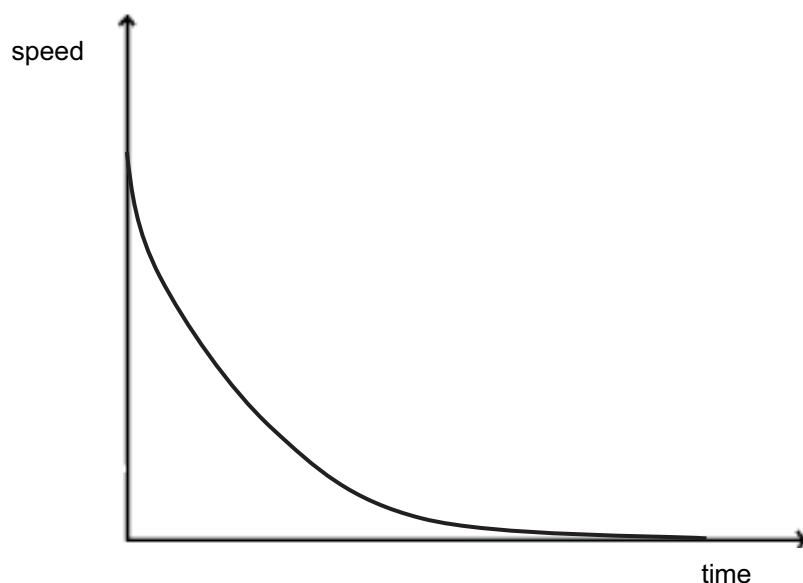
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- 1 (a) (i) **B and D** ; [1]
- (ii) **C** ; [1]
- (b) (on either cell **B** or **D** or a mixture of both) correct labelling of:
 cell wall ;
 vacuole ;
 chloroplast ; [max 2]
- (c) (i) shape **X**, **AND**
 lost less water (by transpiration) ;
 this leaf / shoot has smaller (total) surface area ; [2]
- (ii) (*temperature*) (distance increases as) rate of transpiration increases / more
 water lost in warmer conditions ;
 (*humidity*) (distance increases as) rate of transpiration increases / more water
 lost with reduced humidity ; [2]
- [Total: 8]**
- 2 (a) increases ; [1]
- (b) sodium atoms lose electrons ;
 bromine atoms gain electrons ; [2]
- (c) (i) bromine ; [1]
- (ii) chlorine + sodium bromide → bromine + sodium chloride
 LHS ; RHS ; [2]
- (iii) chlorine displaces bromine but iodine does not displace bromine ;
 a more reactive halogen displaces a less reactive halogen / owtte ;
OR
 chlorine more reactive than bromine and so displaces it ;
 iodine less reactive than bromine so does not displace it ; [max 2]
- [Total: 8]**
- 3 (a) potential (energy) **to** kinetic (energy) ; [1]
- (b) (i) weight / gravitational force ; [1]
- (ii) arrow on Fig. 3.1 pointing upwards ; [1]
- (iii) newton ; [1]

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(c)



straight line / curve from higher on the y-axis with negative gradient ;
line intersects x-axis ;

[2]

(d) any estimate less than 40 m, greater than 25 m ;
weight of man stretching rope ;

[2]

(e) (KE causes) friction in the rope as it stretches and slackens / owtte ;

[1]

[Total: 9]

4 (a) (i) urethra correctly labelled ;
prostate gland correctly labelled ;

[2]

(ii) yes, **AND**
the sperm duct / tube ;
on the unblocked / other side is clear ;
idea of clear route for sperms (from testis) ;
allow: idea of reduced fertility ;

[max 3]

(b) (i) days 0–5 / 6 / 7 and / or 30–35 / 36 / 37 ;
lining of uterus is being shed / breaking down ;

[2]

(ii) day 14 / 15 / 16 ;

[1]

(iii) controlled by hormones / controlled by ovaries ;

[1]

(iv) for implantation / nourishment of embryo / ball of cells ;

[1]

[Total: 10]

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5 (a) natural gas / biogas ; [1]

(b) (i)

<i>gases present before the explosion</i>		<i>gases present just after the explosion</i>
(methane)	➔	carbon dioxide
(oxygen)		water (vapour)
(nitrogen)		nitrogen

(all 3 correct for 2 marks, 2 correct for 1 mark)

::

[2]

(ii) exothermic ;

[1]

(c) (i) C_9H_{20} ;

[1]

(ii) covalent ;
bonding between non-metals / electron sharing ;

[2]

(d) (i) condenses ;

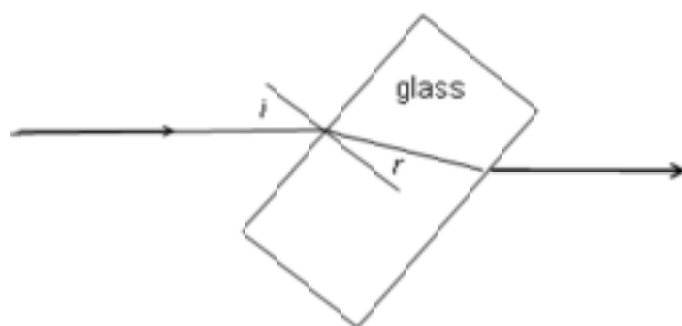
[1]

(ii) different boiling points ;

[1]

[Total: 9]

6 (a)



ray in glass bent towards normal ;
emergent ray parallel to incident ;
i and *r* clearly marked for correct angles ;

[3]

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(b) (i) ultra-violet/X-rays/gamma radiation ; [1]

(ii) infra-red/IR ; [1]

(c) (i) wavelength shown correctly and clearly ;
amplitude shown correctly and clearly from x-axis to peak ; [2]

(ii) loudness/volume ; [1]

[Total: 8]

7 (a)

<i>component of blood</i>	<i>function</i>
plasma	transport of oxygen
platelets	clotting of blood
red blood cells	defence against disease
white blood cells	transport of dissolved substances

(all correct for 2 marks, 2 or 1 correct for 1 mark)

;;

[2]

(b) (i) diffusion happens from a higher to a lower concentration ; [1]

(ii) used to react/break down glucose ;
during respiration ; [2]

(iii) any flight/fight/fear situation described ; [1]

(iv) increase in pulse rate ;
increase in blood glucose ;
AVP ; [max 2]

[Total: 8]

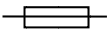
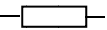
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- 8 (a) (i) flame/lighted splint ;
explosion/‘pop’/burns with a squeaky pop ; [2]
- (ii) acid concentration decreases ;
acid used up/not enough acid to react with all the iron ;
rate of reaction decreases/reaction stops ; [max 2]
- (iii) silver nitrate ;
white precipitate/owtte ; [2]
- (b) faster/more bubbling ;
increase in temperature causes increase in rate of reaction/reaction finishes more quickly ; [2]
- (c) no reaction/bubbles ;
copper is below hydrogen in the reactivity series/owtte ; [2]

[Total: 10]

- 9 (a) (i) potential difference/p.d. ; [1]
- (ii) current increases/goes up ; [1]
- (iii) meter reading increases/goes up ;
current increases/goes up ;
resistance decreases/goes down in a parallel circuit ; [max 2]
- (iv) $(4 \times 2) = 8 (\Omega)$; [1]

(b)

circuit component	symbol
direct current source	
fuse	
lamp/bulb	
fixed resistor	

;;
(all correct for 2 marks, 2 or 1 correct for 1 mark)

[2]

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(c) (i) convection ; [1]

(ii) description / diagram of suitable apparatus ;
description of observation made that shows convection ; [2]

[Total: 10]