## MARK SCHEME for the October/November 2011 question paper

## for the guidance of teachers

## 0652 PHYSICAL SCIENCE

0652/21

Paper 2 (Core Theory), maximum raw mark 80

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 must be read in conjunction with the question papers and the report on the examination.

• Cambridge will not enter into discussions or correspondence in connection with these mark schemes.

Cambridge is publishing the mark schemes for the October/November 2011 question papers for most IGCSE, GCE Advanced Level and Advanced Subsidiary Level syllabuses and some Ordinary Level syllabuses.



Page 2		ge 2	Mark Scheme: Teachers' version	Syllabus	Paper
			IGCSE – October/November 2011	0652	21
1	(a)	balance	, ,		[1]
	(b)	burette ;			[1]
	(c)	thermom	ieter ;		[1]
	(d)	beaker <b>C</b>	<b>)R</b> burette ;		[1]
					[Total: 4]
2	(a)	50 (m/s)	);		[1]
	(b)	decelera constant			[2]
	(c)	150 (m) ;	rea under graph, S = ½ × 30 × 10 ; ; ion 30 × 10 = 300 m – max 1)		[2]
	(d)	(i) zero	;		[1]
		(ii) men	tion of frictional force ;		[1]
	(e)	car <b>A</b> ; larger gra greater a	adient ; acceleration ;		[max 2]
					[Total: 9]

	Page 3		Mark Scheme: Teachers' version Syllabus		Paper
			IGCSE – October/November 2011	0652	21
3	(a)		example of ionic compound e.g. sodium chloride ; example of covalent compound e.g. ammonia ;		[2]
	(b)	suitable example for ionic compound ; e.g. conduct electricity when molten or in aqueous solution/giant ionic structure /high melting and boiling points/etc.			
		e.g. does	example for covalent compound ; s not conduct electricity when molten/simple molecu Iting and boiling points/etc.	ular structure	[2]
	(c)		showing 2 electrons in outer shell ; with 2 electrons in first shell and 8 in middle shell ;		[2]
					[Total: 6]
4	(a)	bauxite ;			[1]
	(b)	aluminium too reactive ; more reactive than carbon/carbon not reactive enough/will not replace carbon ;		; [2]	
					[Total: 3]
5	(a)	(i) so th	nat the mean temperature of the ice is measured ;		[1]
			ple is below room temperature ; bsorbs energy from the surroundings ;		[2]
	(b)	−2(°C) ;			[1]
	(c)		ture remains constant/ice melting ; es gain potential energy/bonds are broken ;		[2]
					[Total: 6]

Page 4	Mark Scheme: Teachers' version	Syllabus	Paper
	IGCSE – October/November 2011	0652	21

6 (a)

name	formula	mass of 1 mole / g	
water	H <sub>2</sub> O	18	
hydrogen chloride	HC1	36.5	
sodium fluoride	NaF	42	
nitrogen	N <sub>2</sub>	28	

[4]

(b) Na	<sup>+</sup> <b>AND</b> 11 ;
--------	------------------------------

F<sup>-</sup> **AND** 9;

	[2]	

[1]

[1]

[1]

[Total: 6]

- 7 (a) (i) 45;
  - **(ii)** 60 ;
  - (b) (i) (a fast moving) electron ;
    (ii) lease 1 poutron ;
    - (ii) loses 1 neutron ; gains proton ; ('neutron changes to proton' gains 2 marks)

[2]

[2]

- [Total: 5]
- 8 (a) suitable advantage, e.g. no pollution, etc. ;
   suitable disadvantage, e.g. needs to be made, etc. ;
  - (b)  $2H_2 + O_2 \rightarrow 2H_2O$ ;; (correct formulae – 1 mark and correct balancing – 1 mark) [2]
  - (c) lighted splint ; pops ;
     [2]

     (d) (i) ammonia ;
     [1]
    - (ii) Haber/Haber-Bosch ;

[Total: 8]

[1]

	Page 5		Mark Scheme: Teachers' version	Syllabus	Paper
			IGCSE – October/November 2011	0652	21
9	(a)	causing	rating) rubber hits air molecules ; them to vibrate/forming a sound wave ; ntion of vibration 1 max.)		[2]
	(b)		ne frequency (approximately) ; aller amplitude ;		[2]
			nber of waves (or vibrations) per second ; or hertz ;		[2]
					[Total: 6]
10	(a)	halogen	IS ;		[1]
	(b)	fluorine/	/bromine/iodine/astatine ;		[1]
	(c)		use of chlorine ; ter sterilization/making plastics/etc.		[1]
	(d)	magnes	sium ;		[1]
	(e)		chlorine into the solution ; own/yellow ;		[2]
	(f)	35 ; 36 (allov	w e.c.f. on number in atom, i.e. atom + 1 for a max 1)	,	[2]
					[Table: 8]
11	(a)	lamp/bu	ılb ;		[1]
	(b)	(i) 20 g	Ω;		[1]
		(ii) <u>use</u>	e of I = V/R (= 9/20); = 0.45 A;		[2]
		(iii) <u>use</u>	e of V = IR (= 0.45 × 12) ; = 5.4 V ;		[2]
					[Total: 6]

	Page 6		Mark Scheme: Teachers' version	Syllabus	Paper
			IGCSE – October/November 2011	0652	21
12	(a)	alkanes			[1]
	(b)	propane $C_3H_8$ ;	;		[2]
	(c)	contains hydrocar	oxygen ; bons contain hydrogen and carbon only ;		[2]
					[Total: 5]
13	(a)	all lines s	ines between poles ; start on one pole and finish on the other, none touch ointing north to south ;	n each other ;	[3]
	(b)	complete mercury	e circuit ; is a conductor ;		[2]
	(c)	the rod w towards/	vill kick ; away from the observer ;		[2]
	(d)	kick/mov	ve in the opposite direction ;		[1]
					[Total: 8]