

CAMBRIDGE
INTERNATIONAL EXAMINATIONS

NOVEMBER 2002

INTERNATIONAL GCSE

MARK SCHEME
MAXIMUM MARK : 100
SYLLABUS/COMPONENT : 0654/2 CO-ORDINATED SCIENCES (CORE)



UNIVERSITY of CAMBRIDGE
Local Examinations Syndicate

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- 1(a) the community / **all** the living things ;
+ the habitat / all the non-living things ; 2
- (b)(i) blackjack/cotton plant ► aphid ► ladybird ► pied wagtail ; 1
- (ii) cotton plant/blackjack ; 1
- (c)(i) sunlight ;
photosynthesis/description of photosynthesis ; 2
- (ii) jackal eats rabbit ;
energy is (stored) in food / chemical energy ; 2
- (iii) black shouldered kite ;
energy lost along food chains / kite is at end of food chain; 2
- 2(a) gravity downwards in both;
tension upwards in fig C; 2
- (b) stage B;
greatest velocity so greatest KE; 2
- (c) straight line;
through origin; 2
- 3(a) B;
A;
D; 3
- (b)(i) formed over a very long time scale;
from once living material; 2
- (ii) biogas contains carbon dioxide (as well as methane);
carbon dioxide does not burn / less combustible material
in biogas so less heat evolved / owtte; 2
- (c) reference to (large chain) molecules made of repeating units / monomers;
which soften / melt when heated / can be repeatedly remoulded by heating; 2

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4(a)(i)	radicle ; cotyledon	2
(ii)	ovule ;	1
(b)(i)	warm temperature needed ; light not needed ;	2
(ii)	greener/more starch ; because more chlorophyll/photosynthesis ; leaning towards light ; positive phototropism / plant shoots grow towards the light ;	MAX2
5 (a)(i)	250 MJ;	1
(ii)	lost as (waste) heat/sound etc;	1
(iii)	100MW;	1
(b)(i)	cleaner/less pollution; fossil fuels have other uses apart from burning; fossil fuels are running out/non renewable;	MAX 2
(ii)	source; description;	2
(c)(i)	transformer;	1
(ii)	reduce energy losses;	1
6(a)(i)	29; 48; 29; 1;	4

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- (b)(i) transition; 1
- (ii) reference to physical differences
e.g. copper has higher fixed points / harder / stronger
reference to chemical properties
copper less reactive / forms coloured compounds / acts as catalyst; MAX 1
- (c)(i) → copper + carbon dioxide / monoxide; 1
- (ii) reference to mass of oxygen lost /copper oxide has the mass of oxygen
in it copper does not / owtte; 1
- 7(a)(i) vibrate more/faster /have more KE;
particles move further apart; 2
- (ii) particles vibrate more at hot end;
KE /energy passed by collision from one particle to the next; 2
- (b) **strong** attractive force between atoms 1
- (c) 400 J/kg/°C;
doesn't depend on mass; 2
- (d) energy supplied used to weaken bonds;
to allow particles to separate; 2
- 8(a) cell membrane ;
controls what goes in and out of the cell ; 2
- (b)(i) line to nucleus ; 1
- (ii) sperm will fuse with/fertilise egg ;
to restore 46 chromosomes ; 2
- (iii) genetic material / genes ;
instructions for making proteins/determine characteristics of cell; 2

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(c)(i)	testes ;	1
(ii)	controls puberty in males/any correct stated secondary sexual characteristic ;	1
9(a)	paper; ceramics; steel; glass;	4
(b)(i)	atoms of <u>different</u> elements bonded in compound not in mixture/ elements retain properties in mixture and not in compound/ mixture has variable composition compound has formula/ often easier to separate elements in mixture;	1
(ii)	increase pressure; reduce temperature;	2
(iii)	components have different boiling points;	1
(c)(i)	speeds up reaction;	1
(ii)	nitrogen molecules very stable / unreactive / held by strong bonds;	1
10(a)	100W;	1
(b)	less resistance(brighter bulb/more current);	1
(c)	electrical; into heat; and light;	3
(d)	name ; use;	2

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- 11(a)(i) iodine (solution); 1
- (ii) starch present inside tubing but not outside ;
starch molecules too big to get through membrane ; 2
- (iii) glucose present inside tubing and outside ;
glucose diffuses through membrane ; 2
- (b) breaks down/digests starch;
to maltose; 2
- 12(a)(i) 7; 1
- (ii) pH increases;
potassium hydroxide neutralises the acid;
temperature increases;
because the reaction is exothermic / gives out heat (energy); 4
- (iii) → potassium chloride; + water; 2
- (b) bubbles / effervescence;
reaction produces carbon dioxide; 2