

UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

MARK SCHEME for the NOVEMBER 2004 question paper

0654 CO-ORDINATED SCIENCES

0654/02

Paper 2 Core (Theory), maximum raw mark 100

Mark schemes must be read in conjunction with the question papers and the *Report on the Examination*.

- CIE will not enter into discussion or correspondence in connection with these mark schemes.

CIE is publishing the mark schemes for the November 2004 question papers for most IGCSE and GCE Advanced Level syllabuses.

Grade thresholds taken for Syllabus 0654 (Co-ordinated Sciences) in the November 2004 examination.

	maximum mark available	minimum mark required for grade:			
		A	C	E	F
Component 2	100	n/a	48	36	25

The threshold (minimum mark) for B is set halfway between those for Grades A and C.
The threshold (minimum mark) for D is set halfway between those for Grades C and E.
The threshold (minimum mark) for G is set as many marks below the F threshold as the E threshold is above it.

Grade A* does not exist at the level of an individual component.

November 2004

INTERNATIONAL GCSE

MARK SCHEME

MAXIMUM MARK: 100

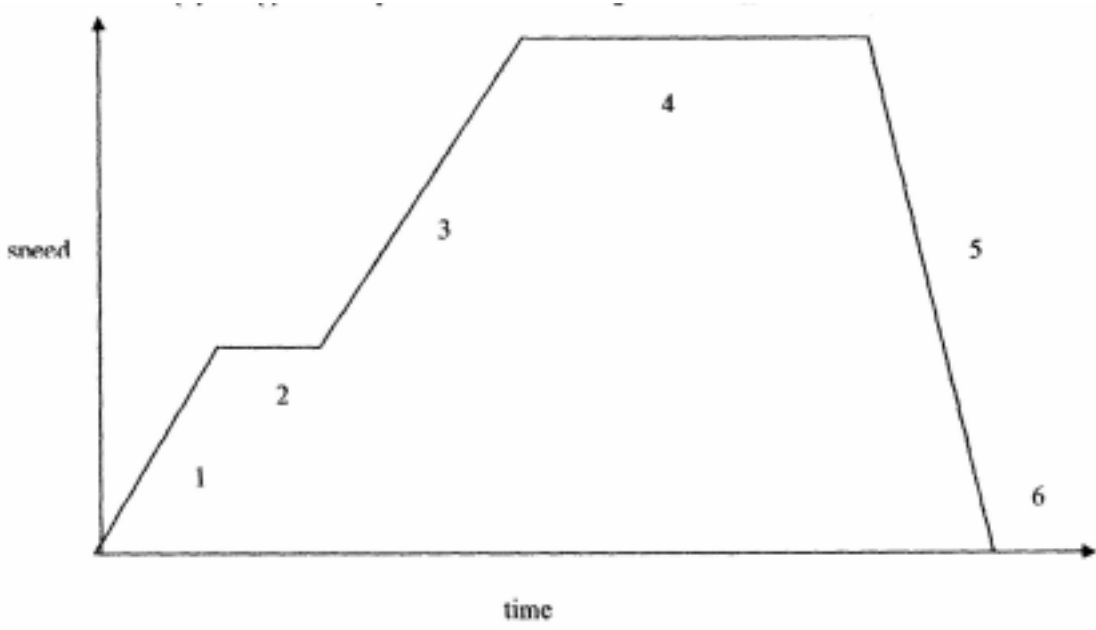
SYLLABUS/COMPONENT: 0654/02

CO-ORDINATED SCIENCES
Paper 1 Core (Theory)

Page 1	Mark Scheme	Syllabus
	IGCSE – NOVEMBER 2004	0654

- 1 (a) tissue
- (b) label line to cell wall or vacuole and name [1]
- (c) chloroplasts;
which contain chlorophyll;
(chlorophyll) absorbs sunlight max [2]
- (d) near the (upper) surface of the leaf;
only one layer/epidermis above them;
epidermis cells have no chloroplasts;
cells are arranged upright/vertically;
so light does not have to pass through several cell walls; max [2]
- (e) down
- the plant is photosynthesizing;
faster than it is respiring;
using carbon dioxide (from the air)
- up
- the plant is respiring
releasing carbon dioxide (into the air) [max 3]
- Total 9**

2 (a) (i) six points to look for see grid below;;; [3]



- (ii) speed = distance/time etc;
- speed =100(km/hr); [2]

Page 2	Mark Scheme	Syllabus
	IGCSE – NOVEMBER 2004	0654

	(b)	$KE = \frac{1}{2} mv^2$ $= 0.5 \times 1000 \times 400 = 200\,000(J)$	[2]
	(c)	(i) all four lamps in parallel; switch in correct place;	[2]
		(ii) there is still a complete circuit for the other bulbs	[1]
		(iii) 13(A)	[1]
			Total 11
3	(a)	C; A; A;	[3]
	(b)	(i) petroleum/crude oil;	[1]
		(ii) named primary product from fractional distillation	[1]
	(c)	(i) barrier; prevents air/oxygen and water; from reacting with steel/iron;	max [2]
		(ii) reference to oil as a barrier (to air and water);	[1]
	(d)	a chemical reaction occurs in the battery; (the reaction) provides electricity; reacting chemicals are used up/not a reversible reaction;	max [2]
			Total 10
4	(a)	A lens; B vitreous humour; C choroids layer;	[3]
	(b)	(i) label line F to retina;	[1]
		(ii) label line P to iris;	[1]
	(c)	as electrical signal/electrical impulse/action potential; along a neurone; in the optic nerve;	max [2]
	(d)	(i) different/longer wavelength;	[1]
		(ii) they are warmer (than their surroundings); they regulate their body temperature/they are homeothermic; heat generated by metabolic reactions/respiration/muscle activity;	max [2]
			Total 10

Page 3	Mark Scheme	Syllabus
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- 5 (a) (i) consists of electrons;
- (ii) pass radiation between oppositely charged plates;
attracted to positive plate;
passes through paper, absorbed by aluminium; max [2]
- (b) evidence of working;
6000 years; [2]
- (c) damages/ionizes cells/DNA;
causes cancer/leukaemia; [2]

Total 7

- 6 (a) (i)

description	name of element
most common metal	aluminium
most common transition metal	iron
most common halogen	chlorine

[3]

- (ii) Na; [1]
- (iii) silicon;
oxygen; [2]
- (b) oxygen in air is free element/exists as oxygen molecules/O₂ simple molecules;
oxygen in earth exists in compounds/as oxides/in giant structures; [2]
- (c) (i) reference to weathering/erosion;
description of a weathering process; [2]
- (ii) provision of minerals/trace elements; [1]
- (iii) air;
organic material/humus;
water;
correct named substance; max [2]

Total 13

- 7 (a) testes;
ovaries; [2]
- (b) they have to move/swim;
if smaller then they use less energy; [2]
- (c) they have only 23 chromosomes/they have half the usual number of
chromosomes/they are haploid; [1]

Page 4	Mark Scheme	Syllabus
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- (d) on chromosomes;
in the nucleus;
in genes;
made of DNA; max [2]
- Total 7**
- 8** (a) yes;
yes;
no;
no;
yes; all correct [2]
- [four correct [1]]**
- (b) stays the same;
at 0°C; [2]
- (c) generator; [1]
- (d) measure of energy output to energy input/useful energy; [1]
- Total 6**
- 9** (a) skier;
greater area in contact with ground; [2]
- (b) pressure = 720/360;
= 2 N/cm²; [2]
- (c) reduce friction; [1]
- (d) (i) the same;
momentum is conserved; [2]
- (ii) speed of woman greater than that of man;
momentum = mass x velocity;
ration of 3:2; max [2]
- Total 9**
- 10** (a) (i) exothermic means reaction gives out heat/reference to increased temperature
from 20°C; [1]
- (ii) experiment 4;
mixture is (still) acidic/pH is below 7/is 1; [2]
- (iii) pH is 7/mixture is neutral;
(this only happens) when amounts of acid and alkali are equal; [2]
- (iv) 4000 dm³; [1]
- (v) this would not produce a neutral mixture/mixture would be alkaline;
alkaline solution causes pollution; [2]

Page 5	Mark Scheme	Syllabus
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	(b)	(i) run-off from agricultural land may contain pollutants; illegal dumping;	max
		(ii) chlorination/use of ozone;	[1]
			Total 10
11	(a)	(i) grass → hog deer → tiger;	[1]
		(ii) energy (transfer);	[1]
		(iii) grass;	[1]
	(b)	(i) digest proteins; to amino acids/polypeptides;	[2]
		(ii) amylase digests starch; no starch in tiger's diet/meat does not contain starch/starch only found in plants;	[2]
	(c)	hair/fur;	[1]
			Total 8