UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

MARK SCHEME for the May/June 2008 question paper

0653 COMBINED SCIENCE

0653/02 Paper 2 (Core Theory), maximum raw mark 80

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All Examiners are instructed that alternative correct answers and unexpected approaches in candidates' scripts must be given marks that fairly reflect the relevant knowledge and skills demonstrated.

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UNIVERSITY of CAMBRIDGE
International Examinations

1 (a) **C**;
A;
F C G;
B; [4]

(b) (i) reacts with/joins with oxygen; [1]
(allow any correct definition of oxidation)

(ii) blue/purple
(reject blue/black)
(metal oxides produce) alkaline (solutions);
orange/red/pink/other obvious red shades;
(non-metal oxides produce) acidic (solutions); [4]
(mark colours and reasons separately)

(iii) neutralisation; [1]

[Total: 10]

2 (a) (i) **B;**

(ii) **E;**

(iii) **A/B;** [3]

(b) (i) diffusion; [1]

(ii) less surface area;
idea of less contact between air and blood;
less diffusion; [max 2]

(c) (i) no nucleus;
biconcave/detailed description of shape; [max 1]

(ii) haemoglobin; [1]

(d) respiration;
for energy;
for oxidation of glucose; [max 2]

[Total: 10]

3 **(a)** **(i)** kinetic/motion/movement energy; [1]

(ii) (gravitational) potential energy; [1]

(b) **(i)** **A** – **B** (constant) acceleration/speeding up;
B – **C** constant speed;
C – **D** (constant) deceleration/slowing down; [3]

(ii) 2.4 m / s (allow 2.3 to 2.5 inclusive); [1]

(c) (average speed =) distance/time;
= 6/3 = 2.0 m/s; [2]

(d) **(i)** 60 N; [1]

(ii) work done = force x distance;
= 60 x 0.5;
30 J; [2]

[Total: 11]

4 **(a)** **(i)** fractional distillation/fractionation; [1]

(ii) different boiling points/intermolecular attractive forces; [1]

(b) **(i)** (kerosene) + oxygen → carbon dioxide + water; (LHS RHS) [2]

(ii) lamp/room/air becomes warm; [1]
(allow any reasonable statement which shows that exothermic means heat is given out)

(c) nucleus labelled/clearly indicated;
electrons arranged 2,4; [2]

[Total: 7]

5 **(a)** decreased;
faster at first/more slowly later; [2]

(b) burning fuels;
at power stations; [2]

(c) reduce vehicle journeys;
(allow any reasonable action which could be taken by the industry itself without compromising profitability/production levels) [1]

(d) ref to greenhouse gas/greenhouse effect;
global warming;
ref to a possible effect of global warming, e.g. flooding; [max 2]

(e) high species diversity;
if we lose rainforests many species lose their habitats;
species may become extinct;
need to preserve possible future sources of beneficial natural products; [max 2]

[Total: 9]

6 **(a)** **(i)** electromagnetic; [1]

(ii) reflection; [1]

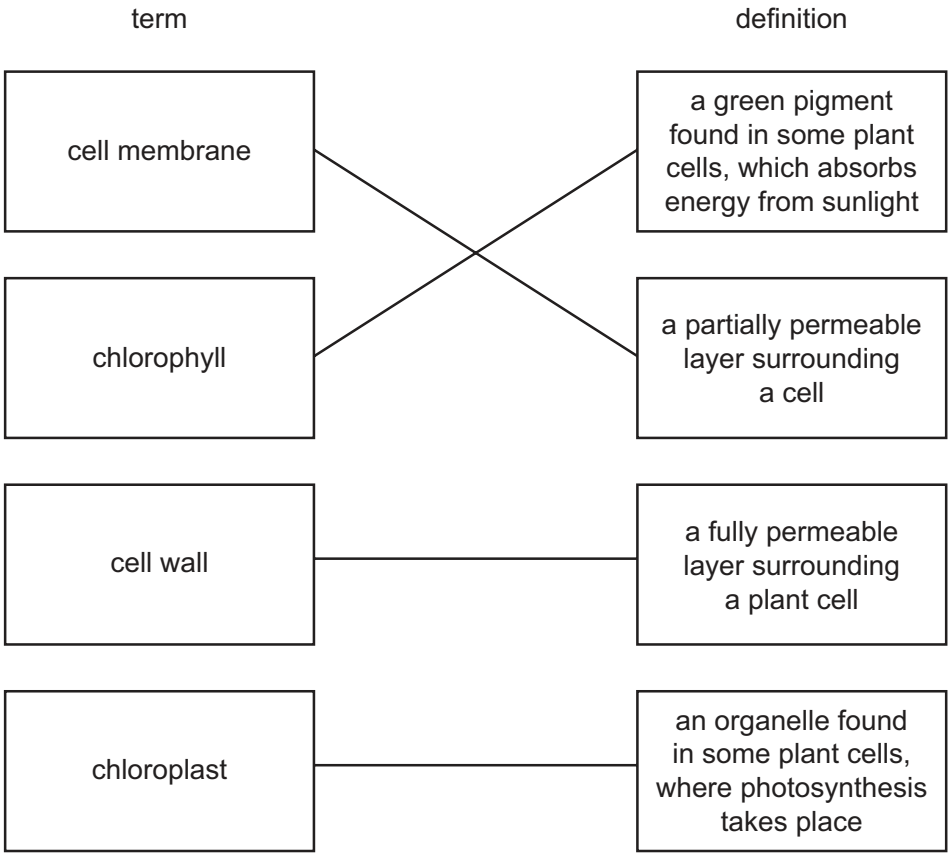
(b) **(i)** correct connections;
correct symbols: [2]

(ii) current/electrical energy can still pass through other lamps/owtte; [1]
(reject because it is a parallel circuit)

(c) 22 cm;
any appropriate working; [2]
(allow error carried forward)

[Total: 7]

7 (a)



all correct 3 marks
two or three correct 2 marks
one correct 1 mark [3]

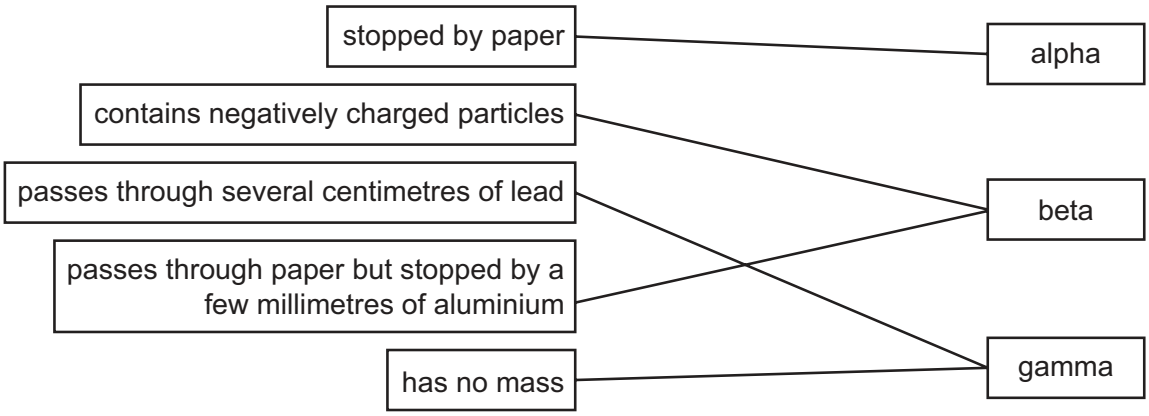
(b) carbon dioxide combined with water;
using (energy from) light;
producing, glucose/sugar, and oxygen;
starch produced from glucose;
many glucoses linked together/polymer of glucose; [max 2]

(c) (i) asexual; [1]

(ii) identical;
(reject similar)
genetically identical/same number and type of chromosomes; [2]

[Total: 8]

8 (a)



5 correct for maximum of 3 marks
3 or 4 correct for 2 marks
1 or 2 correct for 1 mark [3]

(b) (i) ionising/destroys cells; [1]

(ii) use;
e.g. measuring thickness/looking for leaks in pipework/
smoke detectors/carbon dating/cancer treatment
(reject power generation/making bombs) [1]

(c) (i) radiation from natural sources/owtte; [1]

(ii) cosmic radiation/rocks/other reasonable sources [1]

(iii) 1160 cpm; [1]

[Total: 8]

9 (a) (i) copper oxide + hydrogen → copper + water; [1]
(allow formulae if correct in all details)

(ii) reference to:
colour change to brown/orange/electrical conductivity of product; [1]

(b) (i) copper sulphate; [1]

(ii) copper does not react/dissolve/copper does not pass through filter;
soluble copper compound do pass through filter/owtte;
[max 2]

(c) **(i)** ionic; [1]

(ii) reference to attractive force between opposite charges;
correct detail e.g. copper (ions) positive and oxide (ions) negative; [2]

(d) at positive – bubbles of gas/chlorine produced;
(reject references to chloride)
at negative – orange/pink layer/copper produced; [2]

[Total: 10]