

**MARK SCHEME for the October/November 2010 question paper
for the guidance of teachers**

0608 TWENTY FIRST CENTURY SCIENCE

0608/04

Paper 4 (Extended Written), maximum raw mark 60

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.

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

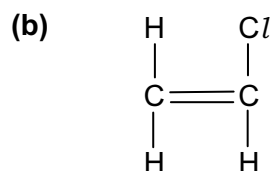
CIE is publishing the mark schemes for the October/November 2010 question papers for most IGCSE, GCE Advanced Level and Advanced Subsidiary Level syllabuses and some Ordinary Level syllabuses.

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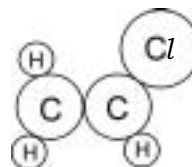
- 1 (a) (i) allows outliers to be identified (and discarded) (1);
allows average/mean to be calculated (1);
indicates range/uncertainty of results (1)
any two [2]
- (ii) $(6 + 5 + 4 + 5 + 5)/5$ (1);
 $= 5$ (1)
two marks for correct answer, one mark for answer 5.6/5.7 [2]
- (b) (i) mean for country road/2 is not in range for city centre **or** mean for city centre/5 is not in range for country road
accept 'ranges don't overlap' [1]
- (ii) it increases the reliability of the conclusions [1]
- (c) $C_7H_{16} + 6O_2 \rightarrow 3C + 4CO + 8H_2O$
one mark for correct products
one mark for balancing [2]

[Total: 8]

- 2 (a) many small molecules/monomers (1);
joining to make one large molecule/chain (1) [2]



or



accept single line for double bond but reject repeating unit with extra bonds on sides [1]

- (c) (molecules of plasticizer get between molecules of polymer and) reduce forces of attraction between them [1]
- (d) consequence of disposal is different (1); because window frames last longer before they have to be disposed of (1)
or
manufacture of product from material is different (1); and has different materials/energy needs (1)
first mark is for identifying the difference and the second for qualifying it. [2]

[Total: 6]

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- 3 (a) (too much) sugar/carbohydrate (1);
fat/oil (1);
fast food/junk food (1)
any two points [2]
- (b) they can assess the likelihood/risk to their health of becoming obese (1);
and how serious any disease they develop may be (1) [2]
- (c) think that it can't happen to them (1);
enjoy unhealthy food too much (1);
cannot afford healthy food (1);
cannot afford time to prepare healthy food (1);
do not believe the research (1);
peer group pressure (1);
happy with body shape (1);
can get treatment for heart disease (1)
any two [2]
- [Total: 6]**
- 4 (a) (i) geometric fit of continents (1);
similarity of fossils in different continents (1);
similarity of rock layers in different continents (1);
mountain chains in 'leading edge' of different continents suggest movement across crust (1)
any two
accept similar plants/animals in different continents [2]
- (ii) movement of continents not detectable (1);
no mechanism for movement known (1);
Wegener an outsider to the community of geologists (1);
too big an idea from limited evidence (1);
simpler explanations of same evidence (1)
any one [1]
- (b) molten rock rises and forces plates apart/fresh rock emerges (1);
growth in ocean bed gives evidence for continental drift (1)
allow magnetic stripes and symmetry about mid-ocean ridge for one mark [2]
- (c) build stronger buildings (1);
prepare emergency plans/practice those plans (1);
train emergency services what to do in earthquakes (1);
train people what to do in earthquakes (1);
research causes and prediction of earthquakes (1);
develop early warning systems (1)
any two [2]
- [Total: 7]**

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- 5 (a) fossils show features of living things (1);
 can be dated (C dating or based on the layers in which they are found) (1);
 can show gradual change in features of living things over time (1) [2]
- (b) organisms/living things are born with variation (1);
 variation is due to mutation (1);
 organisms compete for resources (1);
 idea of survival of the fittest (1);
 only survivors pass on their genes/reproduce (1)
any three points [3]
- (c) 1 and 4
treat 2 as neutral [1]
- (d) alternative views of creation (by God) were very established (1);
 contravened an established model of creation (1);
 required the Earth to be much older than was thought possible (1);
 could not show evolution taking place (1);
 not enough evidence (1);
 mechanism (genes) not then known (1)
any one [1]
- [Total: 7]**
- 6 (a) identifying the two processes (respiration and photosynthesis) by letters or descriptions or names (1);
 quantities the same (1)
A+B+C=D would be 2 marks [2]
- (b) burning fossil fuels (1);
 burning forests to clear land (1)
either point [1]
- (c) the two factors are correlated (1);
 cause requires a (proven) mechanism/causal link (1);
 may be other factors involved (1)
any two points [2]
- [Total: 5]**

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- 7 (a) (i) greater amount of chemical (1);
chemical is more radioactive (1);
emits more damaging radiation (1);
in body for longer time (1)
any two points [2]
- (ii) total dose = 2 + 8.3 = 10.3mSv (1);
%age = $(8.3\text{mSv}/10.3\text{mSv}) \times 100 = 81\%$ (1)
ecf for 2nd mark [2]
- (iii) risk is small (1);
benefit is accurate diagnosis (1);
benefit outweighs risk (1)
any two points [2]
- (b) regular monitoring/wear radiation badge (1);
take off duty if dose getting high (1);
or
protective clothing / shielded apparatus (1);
reduce radiation reaching her (1)
method (1) and explanation (1) [2]
- [Total: 8]**
- 8 (a) (i) proteins; [1]
- (ii) enzymes/structural proteins;
accept any correct protein function [1]
- (b) father(M) has genotype aa (1);
Punnett square complete (1);
50% or equivalent e.g. 1 in 2 (1)
ecf from father must be fraction of aa in Punnett square [3]
- (c) (i) to know if they have the disease (1);
will know if they have a chance of passing the disease on to their children / see if they
are a carrier(1);
plan their life(1);
choose whether or not to have children (1)
any point [1]
- (ii) stressful having the test (1);
could have a false result (1);
should not interfere with nature (1);
may not want to know (1);
may not want others to know (1)
allow could be discriminated against by employers/insurers [1]
- [Total: 7]**

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- 9 (a) CBDA [1]
- (b) Trial has two (matched) groups, one receiving treatment and one a placebo (1);
patient does not know which group they are in (1);
scientist/doctor does not know which group is which (1) [3]
- (c) patients are so ill they are unlikely to get better by themselves;
unfair not to give all patients the chance of successful treatment [2]

[Total: 6]