

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

0608 TWENTY-FIRST CENTURY SCIENCE

0608/03

Paper 3 (Core 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.

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- 1 (a) (i) fatigue/tiredness/pain in joints/dizziness/increased pulse rate/increased blood pressure/
lack of energy/feeling weak
'unconscious' by itself is neutral and not worth a mark [1]
- (ii) less oxygen carried in the blood/cells block blood vessels
Not 'lack of blood/ red cells' [1]
- (b) (i) aa [1]
- (ii) S [1]
- (iii) Aa in each left-hand square (1);
aa in each left-hand square (1) [2]
- (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: 8]**
- 2 (a) antibiotic [1]
- (b) to make sure they work/are effective (1);
to make sure they are safe (1);
to identify side effects (1);
find correct dose (1)
Any two points [2]
- (c) B immediately after C (1);
DA (1) [2]
- [Total: 5]**

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- 3 (a) they contain chlorine/they do not contain only hydrogen and carbon [1]
- (b) many small molecules/monomers (1);
joining to make one large molecule/chain (1) [2]
- (c) asbestos (1); polythene (1) [2]
- (d) (i) plasticiser (1) [1]
- (ii) window frames need to be rigid/must not be flexible (1);
otherwise they will bend/glass will fall out (1) [2]
- [Total: 8]**

- 4 (a) (i) they can copy themselves/reproduce [1]
- Allow multiply*

(ii)

analysis of ... DNA	✓	(1)
competition		
fossils	✓	(1)
... millions of years		
variation		

*One for each correct choice.
Deduct one mark for each extra tick.* [2]

- (iii) all died out/none left [1]
- (b) (i) 3 [1]
- (ii) 1 [1]
- (iii) 1 and 4 [1]

[Total: 7]

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5 (a) 4

accept 9 (value of sample 4) [1]

- (b) (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) any idea that conditions may vary with time e.g. traffic may be more at some times than others/wind may be blowing stronger at some times.
Must refer to same location.

Allow also difficulty in assigning a number for each 'greyness' [1]

- (iii) $(2 + 1 + 1 + 3 + 2 + 3) / 6$ (1);
 $= 2$ (1) [2]

- (c) they are deposited on surfaces/washed out by rain [1]

[Total: 7]

6 (a) (i) correct quantities/proportion (1);
of different food groups (1);

Could refer to recommended daily intake
Second mark could be a list of at least two different types from carbohydrate, fat, protein, vitamins, minerals, fibre and water [2]

- (ii) (too much) sugar/carbohydrate (1);
fat/oil (1);
fast food/junk food (1)

Any two points [2]

- (b) heart disease/stroke/diabetes

allow high blood pressure [1]

[Total: 5]

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- 7 (a) (i) The continents move on the Earth's surface [1]
- (ii) 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]
- (iii) He was an outsider/did not understand geology
- Accept no evidence or previous theories worked well.*
Need to link lack of training to lack of understanding [1]
- (b) (i) on the edge of tectonic plates/where two plates meet [1]
- (ii) stronger [1]
- [Total: 6]**
- 8 (a) (i) D [1]
- (ii) B or C or A or any combination of them [1]
- (b) total CO₂ in A, B and C together (1);
equal total CO₂ in D (1)
- idea of balance*
Can use names or descriptions of processes instead of letters [2]
- (c) one thing changes and the other thing changes at the same time/changes in same (or opposite) direction
- No mark for choosing Dr Salim* [1]
- (d) burning fossil fuels (1);
burning forests to clear land (1)
- either point* [1]
- [Total:6]**

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9 (a) (i) lung [1]

(ii) bone, heart and kidney (any order) and NOT lung

All 3 for 2 marks

any two excluding lung for 1 mark.

[2]

(iii) 4.6 (mSv)

[1]

(iv) greater amount of chemical (1);
more radioactive chemical (1);
in body for longer time (1)

Any two points. Allow possible mechanism e.g. 'lungs breathe it out' for one marking point

[2]

(b) Benefit large/risk small (1);
benefit from the scan outweighs the risk (1).

[2]

[Total: 8]