

**MARK SCHEME for the October/November 2011 question paper
for the guidance of teachers**

8780 PHYSICAL SCIENCE

8780/02

Paper 2, maximum raw mark 30

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 0.2 s, accept 0.05 to 0.5s [Total: 1]
- 2 greater distance AND greater mass/momentum/inertia [1]
 thus less deceleration for the same force [1]
 note: accept equal distance AND greater weight therefore greater fictional force (between tyres and road) (1), balances greater mass (1)
 accept similar argument for smaller distance for maximum 1
 [Total: 2]
- 3 weight is the gravitational pull on an object [1]
 Earth's gravitational field strength greater than/different from Moon's [1]
 [Total: 2]
- 4 mean/average mass of an atom [1]
 relative to 1/12 mass of a ¹²C atom [1]
 [Total: 2]
- 5 (a) different number of neutrons [1]
 (b) same number of protons and electrons [1]
 (accept electron configuration) [1]
 [Total: 2]
- 6 (a) $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^2$ [1]
 (b) $\frac{(70 \times 24.4) + (72 \times 32.4) + (74 \times 43.2)}{100}$ [1]
 = 72.4 [1]
 [Total: 3]
- 7 any two from:
 number of protons increases
 size of atoms decreases
 attraction between nucleus/protons and outer electrons increases [max 2]
 [Total: 2]

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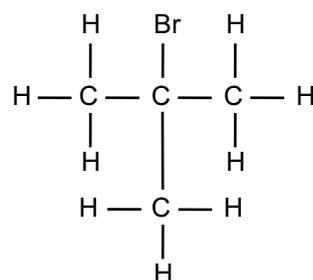
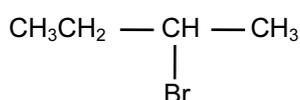
- 8 12 joule of work done/energy transferred
when each coulomb (of charge moves between the two points)

[Total:]

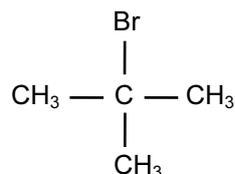
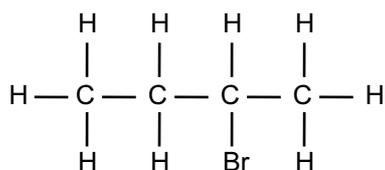
- 9 not all GPE is transferred to electrical energy o.w.t.t.e./energy transferred to surroundings [1]
work also done against friction [1]

[Total: 2]

10



[2]



1-bromo(-2-)methylpropane
allow 2-methyl-1-bromopropane

[1]

[Total: 3]

- 11 $n\text{CH}_2=\text{CHCH}_3 \rightarrow$ polymeric structure (CH_3 side chain)
one mark for correct repeat unit, second mark for correct equation

[2]

[Total: 2]

- 12 (a) any position to left or right of **W** (horizontal by eye)

[1]

(b) arrow pointing away from **W** parallel to displacement

[1]

[Total: 2]

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13 (a) point at the same level as P AND
pressure is not dependent on the tube width/only depends on density and depth

(b) point above P AND
density of sea water greater than fresh water [1]
accept point below P AND sea water less dense

[Total: 2]

14

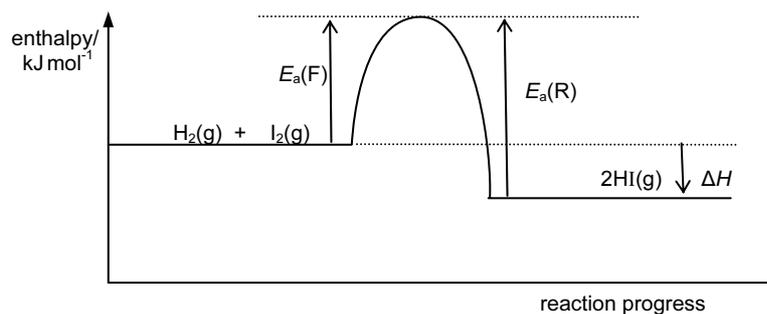


diagram has correct exothermic profile (+ product labelled) [1]
 E_a labels are clear and correct direction of arrows [1]
 ΔH correctly shown and labelled [1]

[Total: 3]