M1.(a) Statement Structure

- The substance is a gas
- The substance is a liquid
- The substance is ionic
- The substance is a solid metal

more than one line drawn from a variable negates the mark

(b) Carbon

1

c) It has delocalised electrons

1

d) the atoms / particles / ions are different sizes

*do not accept molecules*

1
so there are no rows / layers to slide

accept the layers are disrupted

\[
\frac{2}{27} \times 100
\]

7.4%

allow 7.4% with no working shown for 2 marks

(f) Mixture
M2. (a) any one from:

- protection / improve lifespan
- improve appearance.

(b) (i) Bleach

(ii) Hydrogen is less reactive than sodium

(iii) 1 bonding pair of electrons 6 unbonded electrons on Cl

accept dot, cross or e or – or any combination

(iv) Covalent

(v) Hydrogen chloride has a low boiling point.

Hydrogen chloride is made of simple molecules.

(c) (i) oxygen

accept carbon dioxide

(ii) aluminium ions are positive

so are attracted (to the negative electrode)

allow opposites attract

(iii) Reduction

(iv) slide

allow move

(d) (i) C
(ii) strong covalent bonds
M3. (a) (i) high

(ii) hundred

(b) hard

(c) (i) carbon

(ii) four

(iii) covalent

(iv) all

[7]
M4. (a) layers

which have weak forces / attractions / bonds between them

second mark must be linked to layers

or

which can slide over each other or separate

ignore references to rubbing

(b) covalent
M5. (a) (i) C

(ii) C or D

(iii) A

(b) covalent

(c) layers

can slide / move over each other
accept are weakly bonded (owtte)
allow no bonds between layers
ignore slip / rub
M6. (a) carbon 1

(b) each atom is joined to four other atoms 1

It has a giant structure 1

(c) very small 1 [4]

M7. (a) carbon 1

(b) layers 1

have weak forces / attractions / bonds between them or are only held together weakly

\textit{second mark must be linked to layers}

or

can slide over each other or separate (1) 1

(c) covalent 1 [4]
M8. (a) the diameter of the tube is very small

(b) (i) three

(ii) covalent

(iii) bonds

M9. (a) carbon

(b) all

(c) covalent

(d) four

(e) hard