Chemistry unit 1 homework - Mark schemes

Q1.

(a) proton

1

(b) electron

1

(c) 7

1

4

1

in this order only

1

(d) neutron

1

(e) $\frac{(10 \times 20) + (11 \times 80)}{100}$

1

= 10.8

1

*an answer of 10.8 scores **2** marks*

(f) $\frac{0.2}{10000}$

1

= 2×10^{-5} (nm)

allow 0.00002 (nm)

1

an answer of 2×10^{-5} (nm) scores 2 marks

[10]

Q2.

(a) **J**

1

(b) **M** and **Q**

either order

1

(c) **Q**

1

(d) **M**

1

(e) **L**

1

Q3.

(a) **Level 2 (3-4 marks):**
Scientifically relevant features are identified; the ways in which they are similar / different is made clear.

Level 1 (1-2 marks):
Relevant features are identified and differences noted.

Level 0
No relevant content.

Indicative content

similarities
- both have positive charges
- both have (negative) electrons
- neither has neutrons

differences

plum pudding model	**nuclear model**
ball of positive charge (spread throughout)	positive charge concentrated at the centre
electrons spread throughout (embedded in the ball of positive charge)	electrons outside the nucleus
no empty space in the atom	most of the atom is empty space
mass spread throughout	mass concentrated at the centre

4

Q4.

(a) increase

1

(b) (i) Na^+ **and** Br^-
both required

1

(ii) sodium chloride
allow NaCl
*do **not** allow sodium chlorine*

1

(iii) chlorine is more reactive than bromine
allow converse argument
allow symbols Cl, Cl_2, Br and Br_2
allow chlorine / it is more reactive
*do **not** allow chloride **or** bromide*

1

Q5.

(a) (i) UI / solution turns blue / purple
allow violet / lilac

1

any **two** from:

- floats
- melts / forms a sphere
- moves
  *note: moves on surface = **2** marks (points 1 and 3)*
- effervescence / fizz / bubbles / gas
  ignore the name of the gas
- (yellow) flame
  ignore sparks / ignites / burns
  allow dissolves
- reduces in size
  ignore 'reacts violently' unqualified
  ignore reference to exothermic / heat evolved

2

(ii) **2**Na + **2**H_2O → **2NaOH** + H_2

*correct equation = **2** marks*
allow correct multiples / fractions
if this equation is unbalanced,
*allow **1** mark for NaOH*

2

(b) *it = francium*
*outer electron / shell / energy level must be mentioned once for all **3** marks*

biggest atom **or** (outer) shell / energy level / electron furthest from nucleus **or** most (number of) shells

1

least attraction (to nucleus) **or** most shielding

allow the attraction is very weak
*do **not** allow less magnetic / gravitational attraction*

1

(outer) electron more easily lost / taken

ignore francium reacts more easily / vigorously

1

(c) any **two** from:

ignore other properties / specific reactions
they / it = transition elements

transition elements:

allow if state group 1 elements

- high melting point **or** high boiling point
  - *low melting point or low boiling point*
- high density
  - *low density*

- strong / hard
    - *weak / soft*
- not very reactive
    - *reactive*
- catalysts
    - *not catalysts*
- ions have different charges
    - *+1 ions*
- coloured compounds
    - *white compounds*

2

[10]