**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)      

**1**

= 10.8

**1**

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

(f)      

**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, Cl2, Br and Br2*

*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**H2O → **2NaOH** + H2

*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]**