

Atomic Structure and Model

Q1. (2018)

1(a)(i)

A electrons**(1)****1. The only correct answer is A**

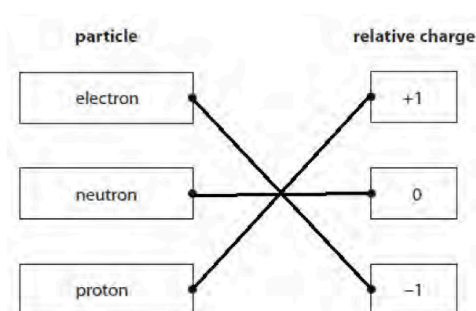
AO 1 1

*B is factually incorrect**C is factually incorrect**D is factually incorrect*

Q2. (2018)

A)

3(a)(i)

do not allow
more than 1
line from
any particle**(2)**

AO 1 1

3 correct = 2 marks

1 correct = 1 mark

B)

3(a)(ii)

C 1**(1)****1. The only correct answer is C**

AO 1 1

*A is not correct because mass is 1**B is not correct because this is relative mass of electron**D is not correct because mass cannot be negative*

Q3. (2018) – 3c

3(c)

A description to include

- both have 18 electrons/2.8.8 (in shells /orbits) (1)
- both have 18 protons (in the nucleus) (1)
- argon-38 has 20 neutrons AND argon-40 has 22 neutrons (in the nucleus) (1)

allow argon 40
has **two** more
neutrons than
argon 38 / ORAignore generic
definition of an
isotope**(3)**

AO 3 1a

AO 3 1b

Q4. (2018) – 8c (ii)

8(c)(ii)	An explanation linking		(2)
	- loss of electron(s) (1) - two electrons (1)	allow gains two electrons for 1 mark zero marks overall if sharing of electrons / gain or loss of protons / positive electrons marks can be awarded for suitably drawn diagram / half equation	AO 1 1

Q5. (2019) – 8a (iii)

8(a)(iii)	A / J	allow mark if both given for A allow Li / lithium for J allow Na / sodium allow use of lower case letters reject answers with any other letters / element names reject answers with + or – charges	(1)
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Q6. (2019) – 8b

A)

8(b)(i)	An explanation linking:		(2)
	(atoms with) same (number of) protons (1) (atoms with) different (number of) neutrons (1)	ignore any mention of electrons reject answers in terms of elements (plural) but allow element (singular) if no other mark: allow same atomic number and different mass number (1)	

B)

8(b)(ii)	A 5 protons is the only correct answer B is not correct because there are 5 or 6 neutrons C is not correct because the atomic number is 5 D is not correct because there are 5 or 6 neutrons	(1)
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Q7. (2019) – 8c

8(c)	2.8.8	allow 2,8,8 2/8/8 2 8 8 or other separator allow correct electron shell diagram	(1)
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Q8. (2020)

2(a)(i)	C 2.8.7	(1)
	A, B, D do not represent electronic configurations	

Q9. (2020) – 2b

A)

2(b)(i)	An explanation linking - same number of electrons and protons (1) - so charges {cancel / balance one another} (1)	allow same number of positive and negative charges	(2)
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B)

2(b)(ii)	37 – 17 (1) (= 20) (neutrons)	allow 20 without working reject '- 20'	(1)
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C)

2(b)(iii)	An explanation linking - atoms {of same element / with same number of protons} / same atomic number (1) - different number of neutrons / different mass number (1)	ignore electrons reject neutrons reject protons /electrons	(2)
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Q10. (2021)

8(a)	Any two from (in modern model) - atoms are formed of sub-atomic particles (1) - atoms have a nucleus (1) - atoms contain protons (1) - atoms contain neutrons (1) - atoms contain (shells of) electrons (1) - atoms of same element can have different numbers of neutrons / isotopes exist (1)	allow (for Dalton's model) atoms are indivisible ignore statements that are simply the negative of those in the question reject each comparison with 'plum pudding model'	(2) AO1
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Q11. (2022)

5(a)	number of electrons = 13 (1) number of neutrons = 14 (1) number of protons = 13 (1)	allow 27-13 (=14)	(3) AO1-1
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Q12. (2022)

9(a)(i)	B 2.8 is the only correct answer A is incorrect as there are too few electrons C and D are incorrect as there are too many electrons		(1) AO1-1
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Q13. (2023) – 6b

6(b)(i)	2.8.2		AO1-1 (1)
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Q14. (2024) – 3b

3(a)	sedimentation → filtration → chlorination (2) first or last step correct (1)		(2) AO1-1
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Q15. (2024)

5(a)	number of protons = 17 (1) number of neutrons = 18 (1) number of electrons = 17 (1)	Accept ONLY whole numbers If no marks scored then maximum 1 mark for number of electrons = number of protons OR $p + n = 35$	(3) AO1-1
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Q16. (2024)

9(a)(i)

B 2.8 is the only correct answer

A is incorrect as there are too few electrons

C and **D** are incorrect as there are too many electrons

(1)
AO1-1