

SMART EXAM RESOURCES
9701 AS CHEMISTRY TOPIC QUESTIONS
TOPIC: ATOMIC STRUCTURE
SUB-TOPIC: CALCULATE SUB-ATOMIC PARTICLES
SET-2

1.1.3-Calculation-of-sub-atomic-particles-set-2

1.

Skin cancer can be treated using a radioactive isotope of phosphorus, $^{32}_{15}\text{P}$. A compound containing the phosphide ion $^{32}_{15}\text{P}^{3-}$, wrapped in a plastic sheet, is strapped to the affected area.

What is the composition of the phosphide ion, $^{32}_{15}\text{P}^{3-}$?

	protons	neutrons	electrons
A	15	17	18
B	15	17	32
C	17	15	17
D	32	17	15

2.

Which ion has more electrons than protons and more protons than neutrons?

[H = ^1_1H ; D = ^2_1H ; O = $^{16}_8\text{O}$]

A D^-

B H_3O^+

C OD^-

D OH^-

3.

In which species are the numbers of protons, neutrons and electrons all different?



4.

Use of the Data Booklet is relevant to this question.

The ^{68}Ge isotope is medically useful because it undergoes a natural radioactive process to give a gallium isotope, ^{68}Ga , which can be used to detect tumours. This transformation of ^{68}Ge occurs when an electron enters the nucleus, changing a proton into a neutron.

Which statement about the composition of an atom of the ^{68}Ga isotope is correct?

- A It has 4 electrons in its outer p subshell.
- B It has 13 electrons in its outer shell.
- C It has 37 neutrons.
- D Its proton number is 32.

5.

Use of the Data Booklet is relevant to this question.

The isotope ^{99}Tc is radioactive and has been found in lobsters and seaweed adjacent to nuclear fuel reprocessing plants.

Which statements are correct about an atom of ^{99}Tc ?

- 1 It has 13 more neutrons than protons.
- 2 It has 43 protons.
- 3 It has 99 nucleons.

The responses **A** to **D** should be selected on the basis of

A	B	C	D
1, 2 and 3 are correct	1 and 2 only are correct	2 and 3 only are correct	1 only is correct

No other combination of statements is used as a correct response.

6.

The phosphide ion $^{31}_{15}\text{P}^{3-}$ and sulfide ion $^{32}_{16}\text{S}^{2-}$ have the same number of which sub-atomic particles?

- 1 neutrons
- 2 electrons
- 3 protons

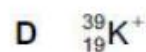
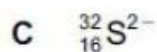
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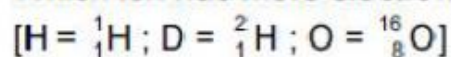
7.

In which species are the numbers of protons, neutrons and electrons all different?



8.

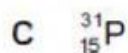
Which ion has more electrons than protons and more protons than neutrons?



9.

Use of the Data Booklet is relevant to this question.

In which species are the numbers of protons, neutrons and electrons all different?



10.

Use of the Data Booklet is relevant to this question.

Which statements are correct when referring to the atoms ^{23}Na and ^{24}Mg ?

- 1 They have the same number of full electron orbitals.
- 2 They have the same number of neutrons.
- 3 They are both reducing agents.

The responses **A** to **D** should be selected on the basis of

A	B	C	D
1, 2 and 3 are correct	1 and 2 only are correct	2 and 3 only are correct	1 only is correct

No other combination of statements is used as a correct response.

11.

Use of the Data Booklet is relevant to this question.

In which set do all species contain the same number of electrons?

- A** Co^{2+} , Co^{3+} , Co^{4+}
- B** F^- , Br^- , Cl^-
- C** Na^+ , Mg^{2+} , Al^{3+}
- D** K_2SO_4 , K_2SeO_4 , K_2TeO_4