

SMART EXAM RESOURCES
9701 AS CHEMISTRY TOPIC QUESTIONS
TOPIC: ATOMIC STRUCTURE
SUB-TOPIC: ISOTOPES
SET-1

1.2.1-Isotopes-Set-1-qp-ms

1.

The table shows the numbers of protons, neutrons and electrons in four different particles, W, X, Y, and Z.

	number of protons	number of neutrons	number of electrons
W	32	40	32
X	32	40	34
Y	32	42	32
Z	34	40	34

Which pair represents the atoms of two isotopes of the same element?

- A** W and Y **B** W and Z **C** X and Y **D** X and Z

2.

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

3.

Technetium (Tc) is a second row transition element that does not occur naturally on Earth. One of its isotopes has 56 neutrons.

What is the nucleon number of this isotope?

- A** 43 **B** 56 **C** 99 **D** 112

4.

Unnilpentium is an artificial element. One of its isotopes is $^{262}_{105}\text{Unp}$.

Which of the following statements is correct?

- A** $^{262}_{105}\text{Unp}$ has a nucleon number of 105.
B The atom $^{260}_{105}\text{X}$ is an isotope of $^{262}_{105}\text{Unp}$.
C There are 262 neutrons in $^{262}_{105}\text{Unp}$.
D The proton number of $^{262}_{105}\text{Unp}$ is 262.

5.

It is now thought that where an element exists as several isotopes, the stable ones usually contain a 'magic number' of neutrons. One of these magic numbers is 126.

Which isotope is unstable?

- A** $^{209}_{83}\text{Bi}$ **B** $^{208}_{82}\text{Pb}$ **C** $^{210}_{84}\text{Po}$ **D** $^{208}_{81}\text{Tl}$

6.

The technetium-99 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.

- A) A
- B) B
- C) C
- D) D

7.

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8.

Use of the Data Booklet is relevant to this question.

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- D $^{208}_{81}\text{Tl}$

9.

A radioactive isotope of thallium, $^{201}_{81}\text{Tl}$, is used to assess damage in heart muscles after a heart attack.

Which statement about $^{201}_{81}\text{Tl}$ is correct?

- A This isotope has a nucleon number of 120.
- B The number of electrons in one atom of this isotope is 81.
- C The number of neutrons in one atom of this isotope is 201.
- D $^{201}_{82}\text{X}$ is an isotope of $^{201}_{81}\text{Tl}$.

10.

Helium, He, is the second element in the Periodic Table.

Tritium is the isotope of hydrogen ^3H .

What is the same in an atom of ^4He and an atom of ^3H ?

- A the number of electrons
- B the number of neutrons
- C the number of protons
- D the relative atomic mass

11.

Use of the Data Booklet is relevant to this question.

Atoms of element X have six unpaired electrons.

What could be element X?

- A carbon
- B chromium
- C iron
- D selenium