

Electronic Structure of an Atom

1. What is the nucleon number for ${}^{40}_{20}\text{Ca}$?

- A 20
B 40

- C 10
D 60

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2. The atoms of element Q can be represented by ${}^a_b\text{Q}$. If Q has 6 protons and 9 neutrons, what are a and b?

	a	b
A	6	9
B	9	6
C	15	6
D	6	15

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3. The atom of element X is represented by ${}^{18}_8\text{X}$. What can we deduce about the atomic structure of X?

- A X has 8 electrons and 18 protons.
B X has 18 neutrons and 18 protons.
C X has 8 neutrons and 18 protons.
D X has 8 electrons and 8 protons.

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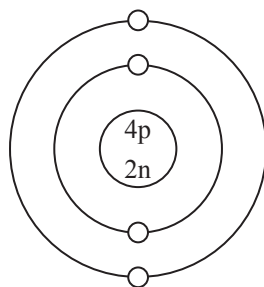
4. What can be deduced from the symbol ${}^{12}_6\text{C}$?

- A An atom of carbon contains 6 electrons in its outermost shell.
B An atom of carbon has 6 protons and 6 neutrons in its nucleus.
C Carbon has a proton (atomic) number of 12.
D Carbon occurs naturally as a diatomic molecule.

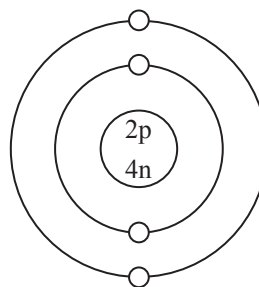
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5. Which diagram shows the structure of a ${}^4_2\text{He}$ atom?

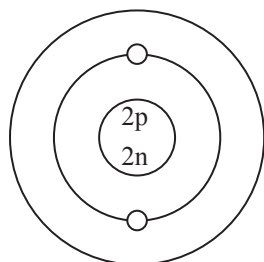
A



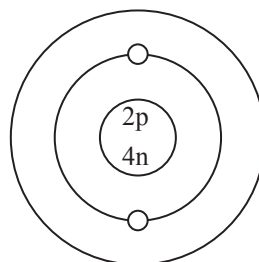
C



B



D



Key

p proton
○ electron
n neutron

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Adapted:

Upper Secondary Chemistry Tutorial

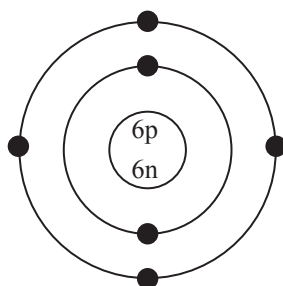
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6. The diagram represents an atom of an element.



Key
 p proton
 ● electron
 n neutron

Which symbol represents this atom?

- A ${}^9_4\text{Be}$
- B ${}^9_5\text{B}$
- C ${}^{12}_6\text{C}$
- D ${}^{24}_{12}\text{Mg}$

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Answers to

1. **B**
2. **C** An atom of element Q has 6 protons (proton number = 6) and 9 neutrons (nucleon number = 6 + 9 = 15).
3. **D** The atom of element X has 8 protons, 8 electrons and 10 neutrons.
4. **B** Carbon has a proton number of 6 (eliminate option C). The electronic configuration of carbon is 2.4. Hence, it has 4 electrons in its outermost shell (eliminate option A). It is naturally a giant molecule (eliminate option D). Since it has a nucleon number of 12 and a proton number of 6, hence, it has 6 neutrons in its nucleus.
5. **B** A helium atom has 2 protons (proton number = 2) and 2 neutrons (nucleon number = 2 + 2 = 4) and 2 electrons.
6. **C** The atom has 6 protons (proton number = 6) and 6 neutrons (nucleon number = 6 + 6 = 12).