

## Exercise 2.37 – The aufbau principle

---

**Q237-01** Which statement is correct about electron orbitals and energy levels?

- A. Yttrium, Y, ( $Z = 39$ ) is the first element in the periodic table with an electron in a f sub-level.
  - B. The maximum number of electrons in one d orbital is 10.
  - C. The maximum number of electrons in the 4th main energy level is 18.
  - D. In a main energy level, the sub-level with the highest energy is labelled f.
- 

**Q237-02** Which is correct about the element tin (Sn) ( $Z = 50$ )?

	Number of main energy levels containing electrons	Number of electrons in highest main energy level
A	4	4
B	4	14
C	5	4
D	5	14

---

**Q237-03** How many electrons are there in **all** the d orbitals in an atom of xenon?

- A. 10
  - B. 18
  - C. 20
  - D. 36
- 

**Q237-04**  $1s^2 2s^2 2p^6 3s^2 3p^6 3d^3 4s^2$  is the ground state electronic configuration of which of the following?

- A. Ca
  - B. Sc
  - C. Zn
  - D. V
- 

**Q237-05** The electron configuration for  $Mn^{2+}$  is:

- A.  $[Ar] 4s^2 3d^3$
  - B.  $[Ar] 3d^5$
  - C.  $[Ar] 4s^1 3d^5$
  - D.  $[Ar] 4s^1 3d^4$
- 

**Q237-06** Which statement about the electron configuration of electrons in the Cs atom is correct?

- A. The outermost two electrons are paired in the same atomic orbital.
  - B. The 4f shell is completely full.
  - C. Only one of the 55 electrons is involved in most interactions of Cs with other atoms.
  - D. The 4f shell is only partially filled.
-

## Exercise 2.37 – The aufbau principle

---

**Q237-07** Which atom has the correct ground state electron configuration?

- A. Cl: [Ne]  $3s^1 3p^6$
  - B. Mn: [Ar]  $4s^1 3d^5$
  - C. Cu: [Ar]  $4s^2 3d^8$
  - D. As: [Ar]  $4s^2 4d^{10} 4p^3$
- 

**Q237-08** The correct number of unpaired electrons in the ground state of a neutral cobalt atom is:

- A. 1
  - B. 2
  - C. 3
  - D. 4
- 

**Q237-09** Which electron configuration describes a neutral atom in an excited state?

- A. [Xe]  $6s^2 4f^{14} 5d^{10} 6p^3$
  - B. [He]  $2s^1$
  - C. [Ne]  $3s^1 3p^1$
  - D. [Ar]  $4s^1 3d^5$
- 

**Q237-10** A certain element has the electronic configuration  $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^3$ . Which oxidation states would this element most likely show?

- A. +2 only
  - B. +3 only
  - C. +2 and +5 only
  - D. +2, +3, +4, +5
-