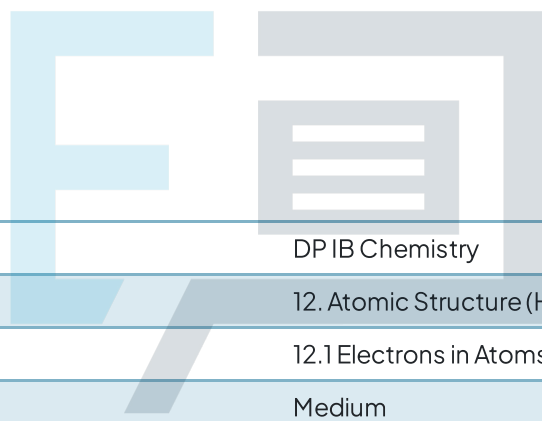




# 12.1 Electrons in Atoms

## Question Paper



Course	DP IB Chemistry
Section	12. Atomic Structure (HL only)
Topic	12.1 Electrons in Atoms
Difficulty	Medium

# Exam Papers Practice

To be used by all students preparing for DP IB Chemistry HL  
Students of other boards may also find this useful

### Question 1

Which of the following calculations gives the correct calculation to find the energy, in kJ, for a photon of blue light given the wavelength  $\lambda = 550 \text{ nm}$ .

$$h = 6.626 \times 10^{-34} \text{ J s}; c = 2.988 \times 10^8 \text{ m s}^{-1}$$

A.  $\frac{6.626 \times 10^{-34} \times 2.988 \times 10^8}{550 \times 10^{-9}}$

B.  $\frac{6.626 \times 10^{-34} \times 2.988 \times 10^8}{550 \times 1000}$

C.  $\frac{6.626 \times 10^{-34} \times 2.988 \times 10^8}{550 \times 10^{-9} \times 1000}$

D.  $\frac{6.626 \times 10^{-34} \times 2.988 \times 10^8}{2.988 \times 10^8 \times 1000}$

[1 mark]

### Question 2

Successive ionisation energies for an element, **Y**, are shown in the table below.

Electrons removed	1st	2nd	3rd	4th	5th
Ionisation energy / $\text{kJ mol}^{-1}$	736	1450	7740	10500	13600

What is the most likely formula for the ion of **Y**?



[1 mark]

### Question 3

Values for the successive ionisation energies for an unknown element are given in the table below.

First ionisation energy / kJ mol <sup>-1</sup>	Second ionisation energy / kJ mol <sup>-1</sup>	Third ionisation energy / kJ mol <sup>-1</sup>	Fourth ionisation energy / kJ mol <sup>-1</sup>
420	3600	4400	5900

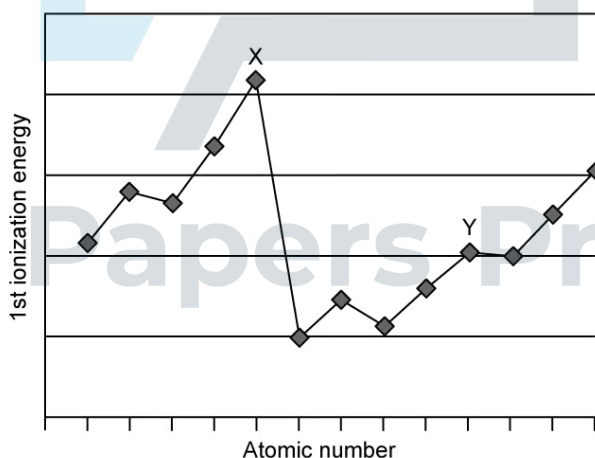
In which group of the periodic table would the unknown element be found?

- A. 1
- B. 2
- C. 13
- D. 14

[1 mark]

### Question 4

The graph shows the first ionisation energies of some consecutive elements



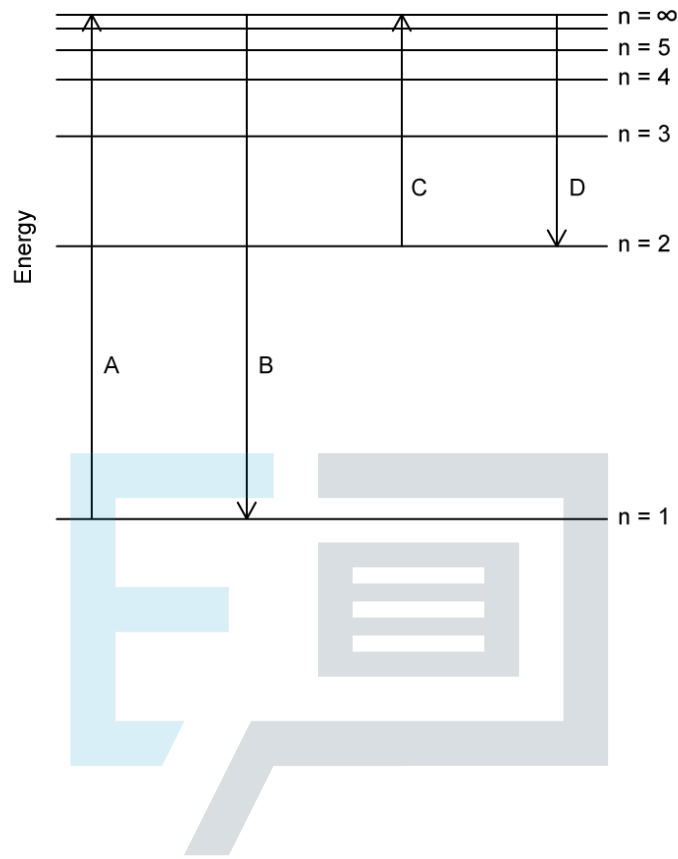
Which statement is correct?

- A. Y is in group 13
- B. Y is in group 10
- C. X is in group 15
- D. X is in group 18

[1 mark]

Question 5

Which transition on the diagram corresponds to the ionisation of hydrogen in the ground state?



[1 mark]