

2.1 Atomic & Electronic Structure

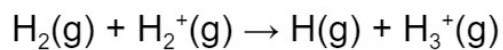
Question Paper

Course	DPIB Chemistry
Section	2. Atomic Structure
Topic	2.1 Atomic & Electronic Structure
Difficulty	Easy

Time allowed: 20
Score: /10
Percentage: /100

Question 1

The reaction shown occurs in gas clouds throughout the Universe.



Which is the correct atomic structure of the H_3^+ ion?

	protons	neutrons	electrons
A	3	0	1
B	3	0	2
C	2	1	1
D	2	1	2

[1 mark]

Question 2

Which row is correct regarding atomic structure?

	The atomic number is the number of	The proton number is the number of	The mass number is the number of
A	atoms	protons	protons
B	electrons	neutrons	nucleons
C	electrons	neutrons	protons
D	protons	protons	nucleons

[1 mark]

Question 3

The phosphide ion, ${}_{15}^{32}\text{P}^{3-}$, is used in medicine as a radiotherapy treatment for some forms of cancer.

What is the composition of the phosphide ion?

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

[1 mark]

Question 4

Which option correctly describes the relative charges and masses of the subatomic particles?

	proton	neutron	electron	the relative mass of an electron
A	+1	0	-1	1
B	0	+1	+1	$\frac{1}{1840}$
C	+1	0	-1	$\frac{1}{1840}$
D	0	+1	-1	1

[1 mark]

Question 5

Which row correctly describes the characteristics of the nucleus and surrounding space?

	nucleus	surrounding space
A	small, dense and neutral	mainly empty space
B	large, dense and positive	densely populated with electrons
C	large, dense and neutral	densely populated with electrons
D	small, dense and positive	mainly empty space

[1 mark]

Question 6

A periodic table is need for this question

X is a particle with 19 electrons and 20 neutrons.

Three species are shown below:



Which of the three species could particle X be?

- A** 1 only **B** 1 and 2 **C** 2 and 3 **D** 1, 2 and 3

[1 mark]

Question 7

The elements of the periodic table have different isotopes.

What is different about the nuclei of stable isotopes?

- A** the same number of protons, but different number of neutrons
- B** the same number of protons, and the same number of neutrons
- C** a different number of protons, and a different number of neutrons
- D** a different number of protons, and the same number of neutrons

Question 8

Iron has many different naturally occurring isotopes.

Isotope	% Abundance	Isotopic mass
^{54}Fe	5.845	53.9396
^{56}Fe	91.754	55.9349
^{57}Fe	2.119	56.9354
^{58}Fe	0.282	57.9333

Using the information given, what is the average atomic mass of iron?

- A** 56.1858 amu
- B** 54.200 amu
- C** 59.270 amu
- D** 55.845 amu

Question 9

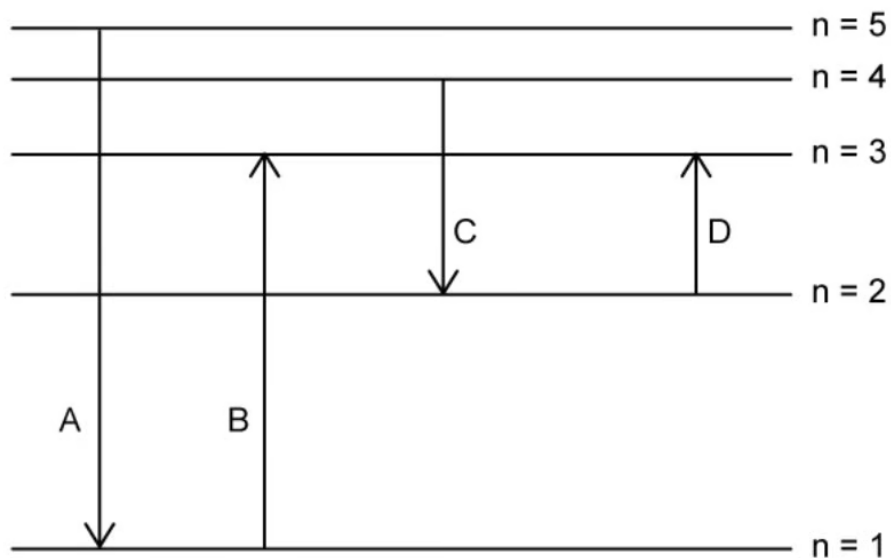
Using the Aufbau Principle and Hund's rule, deduce which element below has the greatest number of unpaired electrons in its ground state.

- A** $Z = 13$
- B** $Z = 14$
- C** $Z = 15$
- D** $Z = 16$

[1 mark]

Question 10

Which electron transition would emit radiation of the longest wavelength?



[1 mark]