

Name \_\_\_\_\_

Date \_\_\_\_\_

## End of Chapter 2 test

*This test and its sample answers have been written by the authors. IB may award marks differently.*

- 1 What is the number of neutrons in the atom Zn-66?
  - A 30
  - B 35
  - C 36
  - D 66
  
- 2 Which of the species below have the largest number of neutrons?
  - A  $^{108}_{47}\text{Ag}$
  - B  $^{128}_{52}\text{Te}$
  - C  $^{127}_{53}\text{I}$
  - D  $^{96}_{42}\text{Mo}$
  
- 3 Which of the species below have less neutrons than electrons?
  - A  $^{65}_{30}\text{Zn}^{2+}$
  - B  $^{79}_{35}\text{Br}^{-}$
  - C  $^{85}_{37}\text{Rb}^{+}$
  - D  $^{31}_{15}\text{P}^{3-}$
  
- 4 Which of the species below have more protons than neutrons?
  - A  $^{40}\text{Ca}$
  - B  $^1\text{H}$
  - C  $^{59}\text{Ni}$
  - D  $^{127}\text{I}$

- 5 A bromine atom has 35 protons and 46 neutrons, what are the values of  $A$  and  $Z$  in its nuclear symbol  ${}^A_Z\text{Br}$ ?
- A  $A = 81$   $Z = 35$   
 B  $A = 35$   $Z = 46$   
 C  $A = 81$   $Z = 46$   
 D  $A = 46$   $Z = 35$
- 6 An element has 49 protons, 66 neutrons and 49 electrons. Which element is it?
- A iridium  
 B dysprosium  
 C indium  
 D rubidium
- 7 Which of the following statements about atoms is correct?
- A All atoms of the same element have the same number of neutrons.  
 B The electrons are found in the nucleus of the atoms.  
 C When losing electrons, atoms become negatively charged ions.  
 D The nucleon number is the number of protons and neutrons in an atom.
- 8 What is the label on the  $x$ -axis of a mass spectrum?
- A charge : mass ratio  
 B size : charge ratio  
 C mass : charge ratio  
 D mass : size ratio
- 9 Rubidium has two naturally occurring isotopes:  ${}^{85}\text{Rb}$  with a natural abundance of 72% and  ${}^{87}\text{Rb}$  with a natural abundance of 28%. What is the relative atomic mass of Rb?
- A 85.56  
 B 85.47  
 C 148.43  
 D 86.00

**10** Gallium has two naturally occurring isotopes,  $^{69}\text{Ga}$  and  $^{71}\text{Ga}$ . The relative atomic mass of gallium is 69.8. What are the natural abundances of these two isotopes?

- A**  $^{69}\text{Ga}$  80.0% and  $^{71}\text{Ga}$  20.0%
- B**  $^{69}\text{Ga}$  50.0% and  $^{71}\text{Ga}$  50.0%
- C**  $^{69}\text{Ga}$  60.0% and  $^{71}\text{Ga}$  40.0%
- D**  $^{69}\text{Ga}$  80.0% and  $^{71}\text{Ga}$  20.0%

Use the table to answer questions 10 and 11.

Species	Nucleon number	Number of protons	Number of electrons
W	37	17	17
X	32	16	18
Y	40	20	18
Z	35	17	18

**11** Which two species are isotopes?

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

**12** Which species are negative ions?

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

**13** The relative atomic mass of copper is 63.55. With which mass is this value compared to?

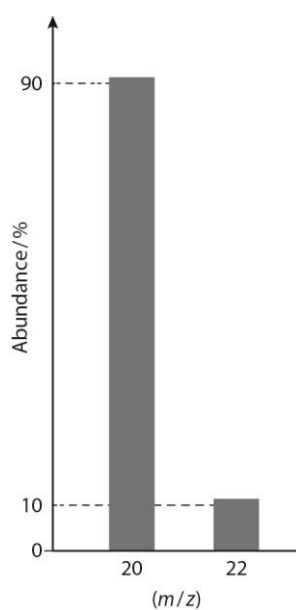
- A** the mass of an atom of H-1
- B**  $\frac{1}{12}$ th of the mass of an atom of H-1
- C**  $\frac{1}{12}$ th of the mass of an atom of C-12
- D** the mass of an atom of C-12

**14** Which statement is correct about the isotopes of an element?

- I They all have the same number of protons.
- II They all have the same nucleon number.
- III They have different chemical properties.

- A I only
- B II only
- C I and II only
- D II and III only

> **15** The mass spectrum of an element is shown. What is its relative atomic mass?



- A 20.1
- B 20.2
- C 20.5
- D 21.0

END OF TEST