

Test bank chapter (2)

Choose the correct answer

NOTE: A periodic table is required to work many of the problems in this chapter.

1. Which of these elements is most likely to be a good conductor of electricity?

- a) N *nonmetal*
- b) S *nonmetal*
- c) He *nonmetal*
- d) Fe *metal* ✓

2. An atom of the isotope sulfur-32 consists of how many protons, neutrons, and electrons?
(p = proton, n = neutron, e = electron)

- a) 15 p, 16 n, 15 e
- b) 16 p, 15 n, 16 e
- c) 16 p, 31 n, 16 e
- d) 32 p, 31 n, 32 e

A → 32
Z → 16

P = 16, e = 16
n = 32 - 16 = 16

3. A magnesium ion, Mg^{2+} , has

- a) 12 protons and 13 electrons.
- b) 24 protons and 26 electrons.
- c) 12 protons and 10 electrons.
- d) 24 protons and 22 electrons.

Z ← 12 *Mg* *+2* *2e*

P = 12
e = 12 - 2 = 10e

4. Which of these pairs of elements would be most likely to form an ionic compound?

- a) P and Br *non, non X*
- b) Cu and K *metal, metal X*
- c) C and O *non, non X*
- d) O and Zn *metal, nonmetal* ✓

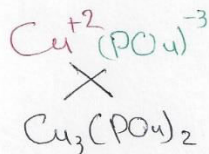
nonmetal & metal

5. The elements in a column of the periodic table are known as

- a) metalloids. *35-36*
- b) a period.
- c) noble gases.
- d) a group.

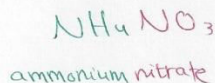
6. Which is the correct formula for copper (II) phosphate?

- a) Cu_2PO_4
- b) $\text{Cu}_3(\text{PO}_4)_2$
- c) Cu_2PO_3
- d) $\text{Cu}(\text{PO}_4)_2$



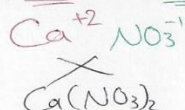
7. The correct name for NH_4NO_3 is

- a) ammonium nitrate.
- b) ammonium nitrogen trioxide.
- c) ammonia nitrogen oxide.
- d) hydrogen nitrogen oxide.



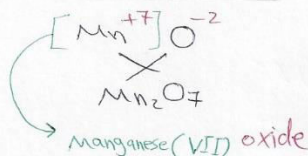
8. What is the formula for the ionic compound formed by calcium ions and nitrate ions?

- a) Ca_3N_2
- b) $\text{Ca}(\text{NO}_3)_2$
- c) Ca_2NO_3
- d) Ca_2NO_2



9. The Stock system name for Mn_2O_7 is

- a) dimanganese heptaoxide.
- b) magnesium oxide.
- c) manganese(VII) oxide.
- d) manganese(II) oxide.



أكسجين (7) (is 7)
 من أكسجين Mn

10. Which of these elements is chemically similar to oxygen?

- a) sulfur
- b) calcium
- c) iron
- d) nickel

عن أكسجين (is 8)

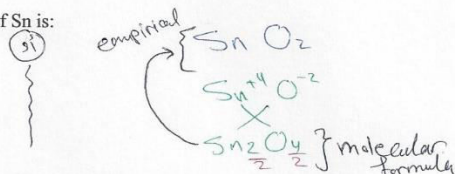
11. The formula of stannic oxide is SnO_2 . The valence of Sn is:

- a) +1
- b) +2
- c) +3
- d) +4

$$X + (-2)(2) = 0$$

$$X - 4 = 0$$

$$X = +4$$



Explanation: to know the charge on Sn atom, make this simple calculation remember that the charge on oxygen atom is -2, let X is the charge on Sn atom

$$X + (-2 (\text{charge on O}) \times 2 (\text{number of O atoms})) = 0 \text{ (equal zero because the compound is neutral)}$$

$$X - 4 = 0 \gg \gg \gg \gg \gg X = +4$$

12. Which pair of atoms constitutes a pair of isotopes of the same element?

- (a). ${}^{14}_6\text{X}$ ${}^{14}_7\text{X}$
 (b). ${}^{14}_6\text{X}$ ${}^{12}_6\text{X}$
 (c). ${}^{17}_9\text{X}$ ${}^{17}_8\text{X}$
 (d). ${}^{19}_{10}\text{X}$ ${}^{19}_9\text{X}$

نفس العنصر

$\begin{matrix} A \\ Z \end{matrix} \text{X}$

Explanation: Isotopes of an element are atoms of the same element with same number of protons but different number of neutrons. Only choice (b) has 2 atoms of X with 6 protons and 8 and 6 neutrons respectively.

13. Elements in Group 8A are known as the _____.

- a) chalcogens
 b) alkali metals
 c) **noble gases**
 d) alkaline earth metals

8A: Nobel gas

14. _____ typically forms ions with a 2+ charge.

- a) Transition metals
 b) Halogens
 c) **Alkaline earth metals**
 d) Alkali metals

$A2 \Rightarrow +2$ شحنة

Alkaline earth metal) 1
 الفلزات القلوية الأرضية

Explanation: The alkaline earth metals are in group 2A of the periodic table and lose 2 electrons to form cations with 2 positive charges.

15. An anion is defined as

- a) **a charged atom or group of atoms with a net negative charge.**
 b) a stable atom.
 c) a group of stable atoms.
 d) an atom or group of atoms with a net positive charge.

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16. A cation is defined as

- a) a charged atom or group of atoms with a net negative charge.
 b) a stable atom.
 c) a group of stable atoms.
 d) **an atom or group of atoms with a net positive charge.**

A

17. Atoms of the same element with different mass numbers (or number of neutrons) are called

- a) ions.
 b) neutrons.
 c) chemical families.
 d) **isotopes.**

18. How many neutrons are there in an atom of lead ${}_{82}^{208}\text{Pb}$ whose mass number A is 208?

- a) 82
b) **126** $n = A - Z = 208 - 82 = 126$
c) 208
d) 290

19. Molecules consist of the same element with different numbers of atoms and chemical structure are called ...

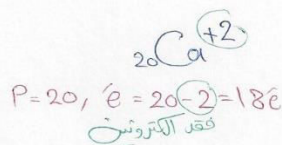
- a) Ions
b) Neutrons
c) **Allotropes**
d) Isotopes

20. An atom of the isotope ${}^{31}_{16}\text{S}$ consists of how many protons, neutrons, and electrons?

- a) 15 p, 16 n, 15 e
b) **16 p, 15 n, 16 e**
c) 16 p, 31 n, 16 e
d) 32 p, 31 n, 32 e

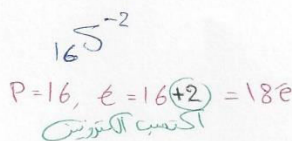
21. A magnesium ion, ${}_{20}\text{Ca}^{2+}$, has

- a) 20 protons and 22 electrons.
b) 20 protons and 20 electrons.
c) **20 protons and 18 electrons.**
d) 22 protons and 20 electrons.



22. A sulfide ion, ${}_{16}\text{S}^{2-}$, has:

- a) 16 protons and 16 electrons
b) 32 protons and 16 electrons
c) 16 protons and 14 electrons
d) **16 protons and 18 electrons**



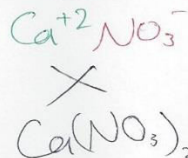
23. Which of these pairs of elements would be most likely to form a molecular compound?

- a) Na and Br (X) فلز ولا فلز
b) Ca and O (X) فلز ولا فلز
c) **C and O** $\text{كلاهما فلز ولا فلز}$
d) Zn and O (X) فلز ولا فلز

لا فلز ولا فلز
 شبه فلز ولا فلز

24. What is the formula for the ionic compound formed by calcium ions and nitrate ions?

- a) Ca_3N_2
b) **$\text{Ca}(\text{NO}_3)_2$**
c) Ca_2NO_3
d) Ca_2NO_2



25. Which is the correct formula for copper(II) phosphate?

- a) Cu_2PO_4
- b) $\text{Cu}_3(\text{PO}_4)_2$
- c) Cu_2PO_3
- d) $\text{Cu}(\text{PO}_4)_2$

26. The correct name for NH_4NO_3 is

- a) **ammonium nitrate.**
- b) ammonium nitrogen trioxide.
- c) ammonia nitrogen oxide.
- d) hydrogen nitrogen oxide.

27. The correct name for PCl_5 is

- a) monophosphate pentachloride
- b) phosphorus chloride
- c) monophosphate tetrachloride
- d) **phosphorus pentachloride**

PCl_5
Phosphorus pentachloride

28. Which of the following expressions represents two molecules of water?

- a) H_2O
- b) H_2O_2
- c) **$2\text{H}_2\text{O}$**
- d) 2HO_2

$2\text{H}_2\text{O}$

29. The empirical formula of a compound with molecules containing 12 carbon atoms, 14 hydrogen atoms, and 6 oxygen atoms is _____.

- a) $\text{C}_{12}\text{H}_{14}\text{O}_6$
- b) $\text{C}_2\text{H}_4\text{O}$
- c) CH_2O
- d) **$\text{C}_6\text{H}_7\text{O}_3$**

$\frac{\text{C}_{12}}{2} \frac{\text{H}_{14}}{2} \frac{\text{O}_6}{2}$ $\frac{\text{C}_6\text{H}_7\text{O}_3}{1}$
أبسط صيغة

Explanation: The empirical formula is always the simplest possible whole number ratio between the atoms of the molecules.

30. The charge on the manganese in the salt MnF_3 is _____.

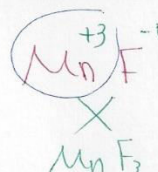
- a) +1
- b) -1
- c) **+3**
- d) -2

$$X + (3(-1)) = 0$$

$$X - 3 = 0$$

$$X = +3$$

(ج)

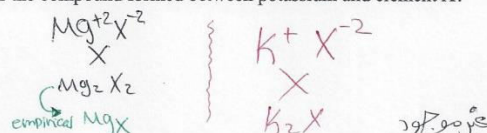


Explanation: Since every F has one negative charge, the Mn can have only 3 positive charges.

30. Magnesium reacts with a certain element to form a compound with the general formula MgX . What would the most likely formula be for the compound formed between potassium and element X?

- a) KX
b) K_2X_2
c) K_2X_3

d) None of the above



Explanation: In the compound MgX , X must have 2 negative charges since Mg will always have 2 positive charges. The element K will always form an ion with 1 positive charge and hence the only combination of K and X could be K_2X , which is not one of the options.

31. Barium forms an ion with a charge of _____.

- a) +1
b) -2
c) +3

d) None of the above.



Explanation: Barium is in group 2A of the periodic table and forms ions with only 2 positive charges.

31. Aluminum forms an ion with a charge of _____.

- a) +2
b) -3
c) +3
d) +1



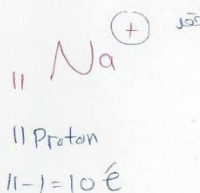
32. Iodine forms an ion with a charge of _____.

- a) -7
b) +1
c) -1
d) +2



33. The chemical symbol for the ion with 11 protons and 10 electrons.

- a) Na
b) F^-
c) Ne
d) Na^+



34. Which of these compounds is a binary compound?

- a) **NaCl** → ثنائي ✓
 b) MgSO₄ 3
 c) NaOH 3
 d) HCN X

35. Atoms with the same number of electrons and number of protons are called...

- a) ions
 b) isotopes
 c) **neutral atoms**
 d) different atoms

36. Atoms which have different number of electrons are called...

- a) **ions**
 b) isotopes
 c) neutral atoms
 d) different atoms

37. Use the following table and choose which of the species are positively charged?

Atom or ion element	I	II	III	IV	V	VI
Atom or ion electrons (e)	6	10	18	10	28	7
Atom or ion protons (p)	6	8	17	11	30	7
Atom or ion neutrons (n)	6	8	18	11	36	6

A. III and V
 B. **IV and V**

C. II and III
 D. I and VI

38. Which isotope has 45 neutrons?

- (a). $^{80}_{36}\text{Kr}$ $80 - 36 = 44$ X
 (b). $^{78}_{34}\text{Se}$ $78 - 34 = 44$ X
 (c). $^{80}_{35}\text{Br}$ $80 - 35 = 45$ ✓
 (d). $^{34}_{17}\text{Cl}$ $34 - 17 = 17$ X

39. In the periodic table, the elements are arranged in _____.

- a) alphabetical order
 b) **order of increasing atomic number**
 c) order of increasing metallic properties
 d) order of increasing neutron content

ترتيب بزيادة العدد الذري

الزاوية العلوية اليمنى

40. An element in the upper right corner of the periodic table is _____.

- a) either a metal or metalloid
- b) definitely a metal
- c) **definitely a non-metal**
- d) either a metalloid or a non-metal

الزاوية السفلية اليسرى

41. An element that appears in the lower left corner of a periodic table is _____.

- a) either a metal or metalloid
- b) **definitely a metal**
- c) either a metalloid or a non-metal
- d) definitely a non-metal

42. A molecular formula always indicates _____.

- a) **how many of each atom are in a molecule**
- b) the simplest whole-number ratio of different atoms in a compound
- c) which atoms are attached to which in a molecule
- d) the isotope of each element in a compound
- e)

43. An empirical formula always indicates _____.

- a) which atoms are attached to which in a molecule
- b) how many of each atom are in a molecule
- c) **the simplest whole-number ratio of different atoms in a compound**
- d) the geometry of a molecule

44. There are _____ protons, _____ neutrons, and _____ electrons in $^{131}_{53}\text{I}^-$.

- a) 131, 53, and 54
- b) 131, 53 and 52
- c) **53, 78, and 54**
- d) 53, 131, and 52

$^{131}_{53}\text{I}^-$ اكتسب إلكترون
 $p = 53, e = 53 + 1 = 54, n = 78 \leftarrow 131 - 53$

45. Which species has 48 electrons?

- (a). $^{118}_{50}\text{Sn}^{+2}$ $50 - 2 = 48e^-$ ✓
- (b). $^{116}_{50}\text{Sn}^{+4}$ $50 - 4 = 46e^-$ ✗
- (c). $^{112}_{48}\text{Cd}^{+2}$ $48 - 2 = 46e^-$ ✗
- (d). $^{68}_{31}\text{Ga}$ $31 - 2 = 29e^-$ ✗