

1. Which electron configuration represents an atom in an excited state?

- A)  $1s^2 2s^2 2p^6 3p^1$                       C)  $1s^2 2s^2 2p^6 3s^2 3p^2$   
B)  $1s^2 2s^2 2p^6 3s^2 3p^1$                       D)  $1s^2 2s^2 2p^6 3s^2$

2. All of the elements in Period 3 have a total of 2 electrons in the

- A) 2s sublevel                      C) 2p sublevel  
B) 3s sublevel                      D) 3p sublevel

3. Which atom in the ground state has three unpaired electrons in its outermost principal energy level?

- A) Li                      C) N  
B) B                      D) Ne

4. What is the total number of valence electrons in an atom with the electron configuration  $1s^2 2s^2 2p^6 3s^2 3p^3$ ?

- A) 6                      C) 3  
B) 2                      D) 5

5. Which orbital notation represents an atom of beryllium in the ground state?

A)  $1s$      $2s$                        $2p$

B)  $1s$      $2s$                        $2p$

C)  $1s$      $2s$                        $2p$

D)  $1s$      $2s$                        $2p$

6. Which element has a completely filled third principal energy level?

- A) Ar                      C) Fe  
B) N                      D) Zn

7. Which atom in the ground state has only 3 electrons in the 3p sublevel?

- A) phosphorus                      C) argon  
B) potassium                      D) aluminum

8. What is the total number of occupied principal energy levels in a neutral atom of neon in the ground state?

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

9. Which sublevel configuration correctly represents a completely filled third principal energy level?

- A)  $3s^2 3p^6 3d^8$                       C)  $3s^2 3p^6 3d^{10}$   
B)  $3s^2 3p^2 3d^{10}$                       D)  $3s^2 3p^6 3d^5$

10. Which atom in the ground state contains a partially filled 3p orbital?

- A) argon                      C) potassium  
B) calcium                      D) aluminum

11. In the ground state, the atoms of elements in Period 2 all have the same number of

- A) protons                      C) 1s electrons  
B) neutrons                      D) oxidation states

12. Which is the electron configuration for a neutral atom in the ground state?

- A)  $1s^2 2s^2 3s^1$                       C)  $1s^2 2s^2 2p^6 3p^1$   
B)  $1s^2 2s^2 2p^4 3s^1$                       D)  $1s^2 2s^2 2p^6 3s^1$

13. Which represents the electron configuration of an isotope of oxygen in the ground state?

- A)  $1s^2 2s^2 2p^1$                       C)  $1s^2 2s^2 2p^2$   
B)  $1s^2 2s^2 2p^2$                       D)  $1s^2 2s^2 2p^4$

14. The total number of sublevels in the fourth principal energy level of an atom is

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

15. Which is a possible electron configuration for argon in the excited state?

- A)  $1s^2 2s^2 2p^7 3s^2 3p^5$                       C)  $1s^2 2s^2 2p^6 3s^1 3p^7$   
B)  $1s^2 2s^3 2p^5 3s^2 3p^6$                       D)  $1s^2 2s^2 2p^6 3s^2 3p^5 4s^1$

16. Which is a correct description of the shape and spatial orientation of the p orbitals in an atom?

- A) All have the same shape but a different orientation.  
B) All have the same shape and the same orientation.  
C) All have a different shape and a different orientation.  
D) All have a different shape but the same orientation.

17. A maximum of 6 electrons can occupy

- A) an s orbital                      C) a p orbital  
B) an s sublevel                      D) a p sublevel

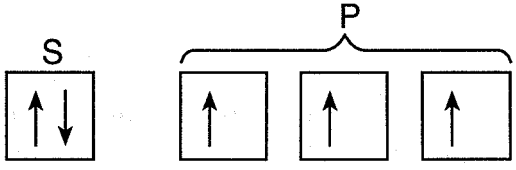
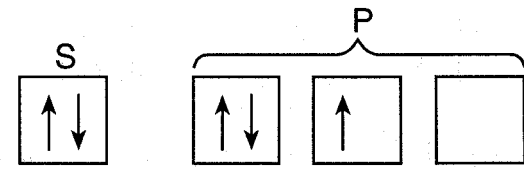
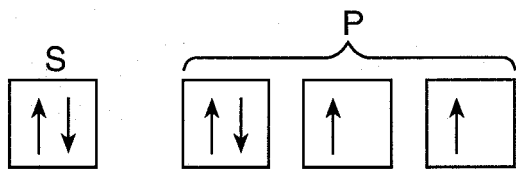
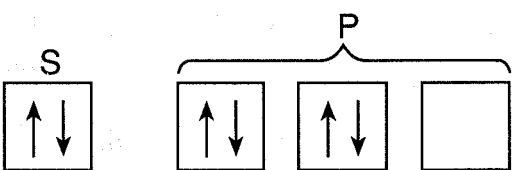
18. How does the ground state electron configuration of the hydrogen atom differ from that of a ground state helium atom?

- A) Hydrogen has one electron in a higher energy level.  
B) Hydrogen has two electrons in a lower energy level.  
C) Hydrogen contains a half-filled orbital.  
D) Hydrogen contains a completely filled orbital.

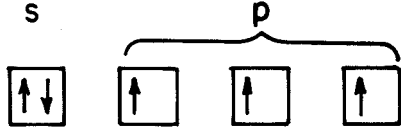

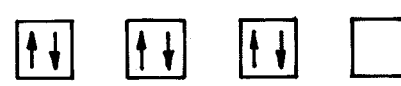

19. Which electron transition represents the release of energy?

- A)  $1s$  to  $3p$                       C)  $3p$  to  $1s$   
 B)  $2s$  to  $2p$                       D)  $2p$  to  $3s$

20. Which orbital notation correctly represents the outermost principal energy level of a nitrogen atom in the ground state?

- A) 
- B) 
- C) 
- D) 

21. Which orbital notation correctly represents the outermost principal energy level of a sulfur atom in the ground state?

- A) 
- B) 
- C) 
- D) 

22. In an atom of lithium in the ground state, what is the total number of orbitals that contain only 1 electron?

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

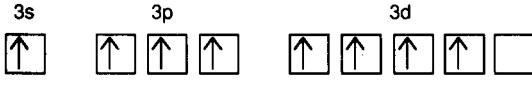
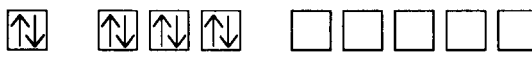
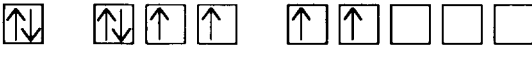

23. What is the total number of orbitals in a  $p$  sublevel

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

24. Which represents the electron configuration of the outermost principal energy level of a Group 15 element in the ground state?

- A)  $s^2p^3$                                   C)  $s^1p^3$   
 B)  $s^2p^5$                                   D)  $s^1p^5$

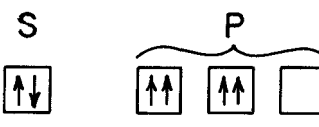



25. Which is the orbital notation for the electrons in the third principal energy level of an argon atom in the ground state?

- A) 
- B) 
- C) 
- D) 

26. Which electron configurations represent the first two elements in Group 17 (VIIA) of the Periodic Table?

- A)  $1s^22s^1$  and  $1s^22s^2$   
 B)  $1s^22s^2$  and  $1s^22s^22p^1$   
 C)  $1s^22s^22p^5$  and  $[\text{Ne}]3s^23p^5$   
 D)  $1s^22s^22p^6$  and  $[\text{Ne}]3s^23p^5$

27. Which orbital notation correctly represents the outermost principal energy level of oxygen in the ground state?

- A) 
- B) 
- C) 
- D) 

28. Which sublevels are occupied in the outermost principal energy level of an argon atom in the ground state?

- A)  $3s$  and  $3d$                               C)  $2s$  and  $3p$   
 B)  $3s$  and  $3p$                               D)  $2p$  and  $3d$

\_\_\_\_ 29. An atom with the electron configuration of  $1s^2 2s^2 2p^6 3s^2 3p^6 3d^5 4s^2$  has an incomplete

- A)  $2p$  sublevel
- B) second principal energy level
- C) third principal energy level
- D)  $4s$  sublevel

\_\_\_\_ 30. In the ground state, which element's atoms have five completely filled orbitals?

- A) Li
- B) B
- C) C
- D) Ne

## Answer Key

1.   A
  2.   A
  3.   C
  4.   D
  5.   C
  6.   D
  7.   A
  8.   B
  9.   C
  10.  D
  11.   C
  12.   D
  13.   D
  14.   D
  15.   D
  16.   A
  17.   D
  18.   C
  19.   C
  20.   A
  21.   D
  22.   A
  23.   C
  24.   A
  25.   B
  26.   C
  27.   C
  28.   B
  29.   C
  30.   D
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Question ID's in Numerical Order.

1. 8
  2. 136
  3. 179
  4. 242
  5. 354
  6. 359
  7. 472
  8. 473
  9. 585
  10. 586
  11. 651
  12. 705
  13. 761
  14. 808
  15. 811
  16. 861
  17. 864
  18. 921
  19. 924
  20. 1038
  21. 1432
  22. 1476
  23. 1597
  24. 1613
  25. 2180
  26. 2195
  27. 2960
  28. 2962
  29. 3285
  30. 3457
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