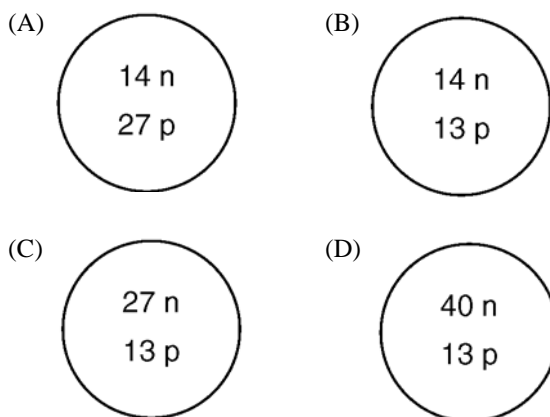


- \_\_\_\_1. Which of these phrases best describes an atom?  
 (A) a positive nucleus surrounded by a hard negative shell  
 (B) a positive nucleus surrounded by a cloud of negative charges  
 (C) a hard sphere with positive particles uniformly embedded  
 (D) a hard sphere with negative particles uniformly embedded
- \_\_\_\_2. The light produced by signs using neon gas results from electrons that are  
 (A) moving from a higher to a lower principal energy level  
 (B) moving from a lower to a higher principal energy level  
 (C) being lost by the Ne(g) atoms  
 (D) being gained by the Ne(g) atoms
- \_\_\_\_3. In the modern wave-mechanical model of the atom, the orbitals are regions of the most probable location of  
 (A) protons (B) neutrons  
 (C) electrons (D) positrons
- \_\_\_\_4. What is the total number of occupied sublevels in the third principal energy level of a zinc atom in the ground state?  
 (A) 1 (B) 2  
 (C) 3 (D) 4
- \_\_\_\_5. What is the total number of sublevels in an atom's fourth principal energy level?  
 (A) 8 (B) 16  
 (C) 3 (D) 4
- \_\_\_\_6. Which sublevel contains a total of 5 orbitals?  
 (A) *s* (B) *p*  
 (C) *d* (D) *f*
- \_\_\_\_7. What is the total number of sublevels in the fourth principal energy level?  
 (A) 1 (B) 2  
 (C) 3 (D) 4
- \_\_\_\_8. What is the total number of electrons needed to completely fill all of the orbitals in an atom's second principal energy level?  
 (A) 16 (B) 2  
 (C) 8 (D) 4
- \_\_\_\_9. What is the total number of sublevels in the third principal energy level?  
 (A) 1 (B) 2  
 (C) 3 (D) 4
- \_\_\_\_10. The maximum number of sublevels in the second principal energy level is  
 (A) 1 (B) 2  
 (C) 3 (D) 4

- \_\_\_\_11. What is the number of orbitals in the first principal energy level?  
 (A) 1 (B) 2  
 (C) 3 (D) 4
- \_\_\_\_12. The maximum number of electrons that a single orbital of the *3d* sublevel may contain is  
 (A) 5 (B) 2  
 (C) 3 (D) 4
- \_\_\_\_13. Which principal energy level has a maximum of three sublevels?  
 (A) 1 (B) 2  
 (C) 3 (D) 4
- \_\_\_\_14. Which principal energy level can hold a maximum of 18 electrons?  
 (A) 5 (B) 2  
 (C) 3 (D) 4
- \_\_\_\_15. Which principal energy level of an atom contains an electron with the lowest energy?  
 (A)  $n = 1$  (B)  $n = 2$   
 (C)  $n = 3$  (D)  $n = 4$

- \_\_\_\_16. Which diagram represents the nucleus of an atom of  ${}^{27}_{13}\text{Al}$ ?



- \_\_\_\_17. The maximum number of electrons that can occupy a principal energy level ( $n$ ) of an atom is equal to  
 (A)  $n$  (B)  $2n$   
 (C)  $n^2$  (D)  $2n^2$
- \_\_\_\_18. What is the maximum number of electrons that can occupy the fourth principal energy level (shell) of an atom?  
 (A) 6 (B) 8  
 (C) 18 (D) 32
- \_\_\_\_19. The modern model of the atom is based on the work of  
 (A) one scientist over a short period of time  
 (B) one scientist over a long period of time  
 (C) many scientists over a short period of time  
 (D) many scientists over a long period of time

