1- What makes up most of the mass of a calcium atom?

a. only protons
b. protons and neutrons
c. only neutrons
d. protons and electrons

2- What is the electron configuration for a Mg-12 atom in the ground state?

a. $1s^2 2s^2 2p^6 3s^2 3p^6 3d^7$
b. $1s^2 2s^2 2p^6 3s^2$
c. $1s^2 2s^2 2p^6 3s^2 3p^6 3d^5 4s^2$
d. $1s^2 2s^2 2p^6 3s^2 3p^6 3d^5 4s^2 4p^1$

3- The characteristic bright-line spectrum of an element is produced when electrons:

a. absorb quanta and move to higher energy levels.
b. release quanta and return to lower energy levels.
c. absorb quanta and return to lower energy levels.
d. release quanta and move to higher energy levels.

4- Knowing that red light has the frequency 4.567×10^{14} HZ its energy.....

(knowing that Plank's constant 6.63×10^{-34} J.s)

a) $4.04X10^{-19}$ b) $2.1\ X10^{-18}$ c) $3.03X10^{-19}$ d) $5\ X10^{-15}$

5- How many electrons are there in the third shell (principal energy level) of the atom with atomic number 23?

a) 18 b) 8 c) 10 d)11

6- A wavelength of light is 389.0 nm and its frequency ..... (1 nm = 10^{-9} m)

a)$77 \times 10^{14}\ s^{-1}$ b)$7.71 \times 10^{14}\ s^{-1}$ c)$5.55 \times 10^{14} s^{-1}$ d)7.71

7 - What is the correct electron configuration for fluoride ion, F^-

a) $1s^2 2s^2 2p^6$ b) $1s^2 2p^6 2s^1$ c) $1s^2 2s^2 2p^4$ d) $1s^2 2s^2 2p^5$

8- spectrum of hydrogen analyzed into many visible colors , the red color caused by the movement of electrons from level .....

a) 5 to 2 b) 3 to 2 c) 7 to 2 c) 6 to 2

9- Which of the following pairs of compounds would give the same flame test ?

a) NaCl , Na_2CO_3 b) $CaCl_2$,NiF_2 c)$NiCl_2$, KBr d)KCl, $CaBr_2$

10- The idea of glow in the dark objects based on ..... phenomena .

a) glowing b) fluorescence c) phosphorescence . d) photon

11- The 4 quantum number for $_8O$ are

a)2,1,-1,1/2 b) 2,1,1,-1/2 c)2,1,-1,-1/2 d) 2,1,1,1/2

12) 3,2,2,1/2 are four quantum numbers for an element with atomic number

a) 26 b) 29 c)30 d)25