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| **المملكة العربية الســــعـودية**  **وزارة التعليم العـــــــالي**  جامــــــــــــــــعة المجمعة  **كلية علوم الحاسب والمعلومات** |  | **Kingdom of Saudi Arabia**  **Ministry of Higher Education**  **Majmaah University,**  **College of Computer &**  **Information Sciences** |

اسم الطالب/ة :....................................... الرقم الجامعي .....................................المجموعة : ............................

**Work Sheet (2 – CH:3+4)**

1.Choose the right answer .

1. The shape of “p” orbital is
2. Circular
3. Elliptical
4. Spherical
5. Dumb-bell
6. A quantum level with n=2 has
7. S and p electrons
8. S,p,d,f electrons
9. S,p,d electrons
10. S electrons
11. The wave length of visible light is in the range
12. 400-700 nm
13. Above 700 nm
14. 300 - 400 nm
15. Below 300 nm

2. How many electrons are present in each shell, subshell, or orbital?

a. a 2p orbital

b. the 3d subshell

c. a 3d orbital

d. the third shell

3. What element has each electronic configuration?

a. 1s22s22p63s23p2

b. 1s22s22p63s23p64s23d1

c. [Ne]3s23p4

d. [Ar]4s23d10

4. When copper is bombarded with high-energy electrons, X rays are emitted. Calculate the energy (in joules) associated with the photons if the wavelength of the X rays is 0.154 nm?

1. Calculate the wavelength (in nm) of a photon emitted by a hydrogen atom when its electron drops from the n = 5 state to the n = 3 state?

Sol.

1. What are the possible quantum numbers for the last (outermost) electron in Cl?
2. What is the de Broglie wavelength (in nm) associated with a 2.5 g Ping-Pong ball traveling at 15.6 m/s?

8. Predict whether the bonds in the following species are ionic or covalent.

a. CO b. CaF2 c. MgO d. Cl2 e. HF

1. What noble gas has the same electronic configuration as each ion derived from the elements.

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| --- | --- | --- | --- | --- |
| elements | magnesium | iodine | selenium | rubidium |
| Noble Gas |  |  |  |  |

10. Give the electronic configuration for each element and then convert it to noble gas notation:

(a) sodium;

(b) silicon;

(c) iodine.

1. Write the valence shell electronic configuration for the elements in periods 4 of group 6A.

12. Rank the atoms in each group in order of increasing size.

a. boron, carbon, neon

b. krypton, neon, xenon

c. calcium, magnesium, beryllium

13. Rank the atoms in each group in order of increasing ionization energy.

a., sodium, potassium, lithium

b. silicon, aluminum, sulfur

c. antimony, phosphorus, nitrogen,

14. Rank the atoms in each group in order of decreasing effective nuclear charge.

a. oxygen, lithium, boron

c. calcium, magnesium, beryllium

d. chlorine, sulfur, aluminum

15. Fill in the blank

***Aufbau principl e, Pauli exclusion principle, Hund’s rule***

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| --- |
| ***No two electrons in an atom can have the same four quantum numbers ……………….. …..*** |
| ***Fill up” electrons in lowest energy orbitals ………………………*** |
| ***The most stable arrangement of electrons in subshells is the one with the greatest number of parallel spins ……………………….*** |