**Unit 03 - In-class Review**

**Choose the best answer from the options that follow each question.**

\_\_\_\_ 1. Neutral atoms contain equal numbers of

|  |  |
| --- | --- |
| a. | electrons and neutrons. |
| b. | protons and neutrons. |
| c. | protons and electrons. |
| d. | protons, electrons, and neutrons. |

\_\_\_\_ 2. Rutherford’s gold-foil experiment led him to conclude that

|  |  |
| --- | --- |
| a. | Thomson’s plum pudding model of the atom was accurate. |
| b. | alpha particles were a poor choice for a bombardment material. |
| c. | a dense region of positive charge existed somewhere in the atom. |
| d. | light was emitted by electrons returning to ground state. |

\_\_\_\_ 3. The isotope uranium-235 has 92 protons and 143 neutrons. Therefore, its mass number is

|  |  |
| --- | --- |
| a. | 92. |
| b. | 235. |
| c. | 143. |
| d. | impossible to determine. |

\_\_\_\_ 4. What is the frequency of light whose wavelength is 633 nm?

|  |  |
| --- | --- |
| a. | 4.74  10-4 Hz |
| b. | 4.74  10-2 Hz |
| c. | 4.74  1014 Hz |
| d. | 4.74  1016 Hz |

\_\_\_\_ 5. What is the frequency of a photon whose energy is 3.4  10-19 J? (*h =* 6.626  10-34 J•s)

|  |  |
| --- | --- |
| a. | 8.8  1026 Hz |
| b. | 5.1  1014 Hz |
| c. | 1.9  10-15 Hz |
| d. | 2.3  10-52 Hz |

**Use the periodic table below to answer the questions in this Chapter Test.**

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\_\_\_\_ 6. Mendeleev organized the chemical elements based on their

|  |  |
| --- | --- |
| a. | symbols. |
| b. | atomic mass. |
| c. | atomic numbers. |
| d. | charges. |

\_\_\_\_ 7. Which of the following elements has the greatest atomic radius?

|  |  |
| --- | --- |
| a. | Al |
| b. | S |
| c. | Si |
| d. | C |

\_\_\_\_ 8. Which of the following elements has the lowest electronegativity?

|  |  |
| --- | --- |
| a. | C |
| b. | F |
| c. | Li |
| d. | O |

\_\_\_\_ 9. Which of the following elements has the greatest ionization energy?

|  |  |
| --- | --- |
| a. | Ga |
| b. | K |
| c. | Bi |
| d. | As |

\_\_\_\_ 10. In his periodic table, Mendeleev listed all of the elements in order of increasing atomic mass and also grouped them according to similar:

|  |  |
| --- | --- |
| a. | properties. |
| b. | atomic numbers. |
| c. | isotopes. |
| d. | charges. |

\_\_\_\_ 11. A new group was added to Mendeleev’s periodic table after the discovery of

|  |  |
| --- | --- |
| a. | alkali metals. |
| b. | electrons. |
| c. | noble gases. |
| d. | atomic nuclei. |

\_\_\_\_ 12. Moseley discovered that elements with similar properties occurred at regular intervals when the elements were arranged in order of increasing

|  |  |
| --- | --- |
| a. | atomic mass. |
| b. | density. |
| c. | radioactivity. |
| d. | atomic number. |

\_\_\_\_ 13. Determine the number of protons, neutrons and electrons in the following:

X

|  |  |
| --- | --- |
| a. | p+ = 18 n° = 18 e- = 22 |
| b. | p+ = 18 n° = 22 e- = 18 |
| c. | p+ = 22 n° = 18 e- = 18 |
| d. | p+ = 18 n° = 22 e- = 40 |
| e. | p+ = 40 n° = 22 e- = 18 |

\_\_\_\_ 14. What species is represented by the following information?

p+ = 12 n° = 14 e- = 10

|  |  |
| --- | --- |
| a. | Si4+ |
| b. | Mg |
| c. | Ne |
| d. | Si |
| e. | Mg2+ |

\_\_\_\_ 15. Calculate the atomic mass of silver if silver has 2 naturally occurring isotopes with the following masses and natural abundances:

 Ag-107 106.90509 amu 51.84%

 Ag-109 108.90476 amu 48.46%

|  |  |
| --- | --- |
| a. | 107.90 amu |
| b. | 108.00 amu |
| c. | 107.79 amu |
| d. | 108.32 amu |
| e. | 108.19 amu |

\_\_\_\_ 16. Calculate the atomic mass of element "X", if it has 2 naturally occurring isotopes with the following masses and natural abundances:

 X-45 44.8776 amu 32.88%

 X-47 46.9443 amu 67.12%

|  |  |
| --- | --- |
| a. | 46.26 amu |
| b. | 45.91 amu |
| c. | 46.34 amu |
| d. | 46.84 amu |
| e. | 44.99 amu |

\_\_\_\_ 17. Calculate the wavelength (in nm) of the blue light emitted by a mercury lamp with a frequency of 6.88  1014 Hz.

|  |  |
| --- | --- |
| a. | 229 nm |
| b. | 436 nm |
| c. | 206 nm |
| d. | 485 nm |
| e. | 675 nm |

\_\_\_\_ 18. Calculate the energy of the red light emitted by a neon atom with a wavelength of 703.2 nm.

|  |  |
| --- | --- |
| a. | 3.54  10-19 J |
| b. | 4.27  10-19 J |
| c. | 2.34  10-19 J |
| d. | 6.45  10-19 J |
| e. | 2.83  10-19 J |

\_\_\_\_ 19. Place the following in order of increasing atomic radius.

|  |  |  |  |
| --- | --- | --- | --- |
|  | As  | O  | Br |

|  |  |
| --- | --- |
| a. | As < Br < O |
| b. | O < As < Br |
| c. | Br < As < O |
| d. | As < O < Br |
| e. | O < Br < As |

\_\_\_\_ 20. Experiments with cathode rays led to the discovery of the

|  |  |  |  |
| --- | --- | --- | --- |
| a. | proton. | c. | neutron. |
| b. | nucleus. | d. | electron. |

\_\_\_\_ 21. The deflection of cathode rays in Thomson's experiments was evidence of the \_\_\_\_ nature of electrons.

|  |  |  |  |
| --- | --- | --- | --- |
| a. | wave | c. | particle |
| b. | charged | d. | spinning |

\_\_\_\_ 22. Whose series of experiments identified the nucleus of the atom?

|  |  |  |  |
| --- | --- | --- | --- |
| a. | Rutherford | c. | Chadwick |
| b. | Dalton | d. | Bohr |

\_\_\_\_ 23. The discovery of what elements added a new column to Mendeleev's periodic table?

|  |  |  |  |
| --- | --- | --- | --- |
| a. | noble gases | c. | transition elements |
| b. | radioactive elements | d. | metalloids |

