

Part B: Modified True/False. Indicate if the following statements are True or False. If you choose False, change the underlined word/phrase to make the statement true. [6 marks]

True/False	Statement	Correction (if necessary)
10. <i>True</i>	An <u>element</u> cannot be broken down into simpler chemical substances by any physical or chemical means	
11. <i>False</i>	If an element is a gas at room temperature, it is likely to be <u>a metal</u> .	<i>a non-metal</i>
12. <i>False</i>	If a negatively charged particle is attracted to a second particle, the second particle must have <u>a negative charge</u>	<i>positive charge</i>
13. <i>False</i>	The Bohr-Rutherford model of the atom is useful for explaining the properties of <u>all of the elements</u> on the Periodic Table	<i>first 20 elements</i>
14. <i>True</i>	An atom with 16 protons, 16 electrons and 18 neutrons has a mass number of <u>34</u> .	$\begin{array}{r} 16 \\ 18 \\ \hline 34 \end{array}$
15. <i>True</i>	As you go down a family on the Periodic Table, the number of electron orbits <u>increases</u> .	

Part C: Matching.

On the Periodic Table shown, sets of elements have been outlined and labelled A through F. Match the sets of elements to the names stated below. [6 marks]

The periodic table shows the following regions outlined:

- A:** Hydrogen (H)
- B:** Lithium (Li), Beryllium (Be), Sodium (Na), Magnesium (Mg)
- C:** Transition metals (Scandium to Zinc)
- D:** Lanthanide and Actinide series
- E:** Boron (B), Carbon (C), Nitrogen (N), Oxygen (O), Fluorine (F), Neon (Ne), Aluminum (Al), Silicon (Si), Phosphorus (P), Sulfur (S), Chlorine (Cl), Argon (Ar), Gallium (Ga), Germanium (Ge), Arsenic (As), Selenium (Se), Bromine (Br), Krypton (Kr), Indium (In), Tin (Sn), Antimony (Sb), Tellurium (Te), Iodine (I), Xenon (Xe), Thallium (Tl), Lead (Pb), Bismuth (Bi), Polonium (Po), Astatine (At), Radon (Rn)
- F:** Helium (He)

16. alkaline earth metals B

17. alkali metals A

18. rare earth metals/inner transition metals D

19. noble gases F

20. halogens E

21. transition elements C

Match the scientist to a key experiment or discovery. [6 marks]

- | | | |
|--------------------------|----------|------------------------|
| 22. billiard ball model | <u>F</u> | A. Bohr |
| 23. the electron | <u>B</u> | B. Thomson |
| 24. first atomic theory | <u>E</u> | C. Chadwick |
| 25. electron orbits | <u>A</u> | D. Rutherford |
| 26. gold foil experiment | <u>D</u> | E. Democritus |
| 27. neutron | <u>C</u> | F. Dalton |

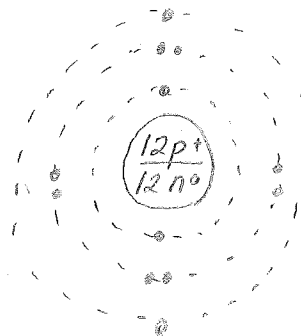
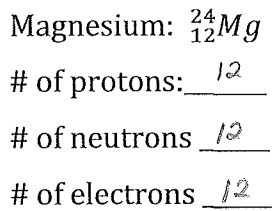
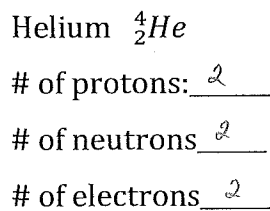
Part D: Short Answer

28. Using the given standard atomic notation, fill in the blanks at the right. [3 marks]



- a. Phosphorous has 15 protons.
 b. Phosphorous has 15 electrons.
 c. Phosphorous has 16 neutrons. 29

29. Using the following standard atomic notations, draw the **Bohr-Rutherford diagram** for: [8 marks]



30. Using examples, explain why you think the Periodic Table is more than just a listing of the known elements. [2 marks]

- organized by patterns
- periods - # of e⁻ shells
- groups - # of valence electrons
- families - common properties (eg noble gases - all non-reactive)
- states - most metals → solids
- most non-metals → liquids