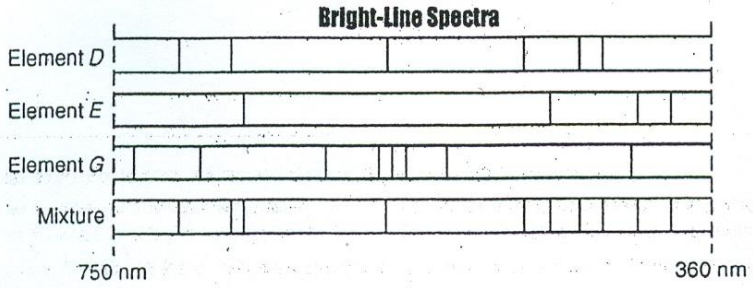
Name: _____

1) As an electron in an atom moves from the ground state to the excited state, the electron
   A) gains energy as it moves to a lower energy level
   B) gains energy as it moves to a higher energy level
   C) loses energy as it moves to a lower energy level
   D) loses energy as it moves to a higher energy level

2) An atom of oxygen is in an excited state. When an electron in this atom moves from the third shell to the second shell, energy is
   A) emitted by the nucleus
   B) emitted by the electron
   C) absorbed by the electron
   D) absorbed by the nucleus

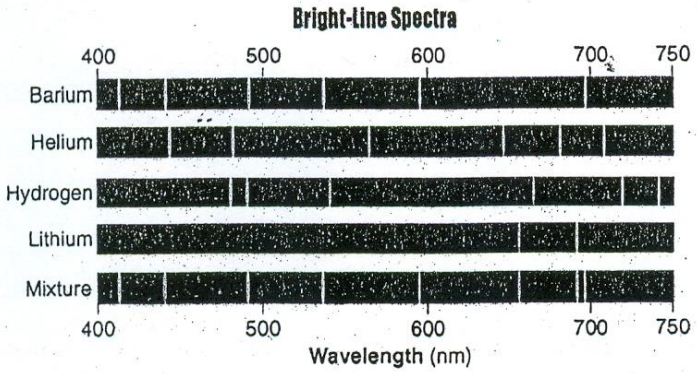
3) During a flame test, ions of a specific metal are heated in the flame of a gas burner. A characteristic color of light is emitted by these ions in the flame when the electrons
   A) emit energy as they return to lower energy levels
   B) gain energy as they move to higher energy levels
   C) gain energy as they return to lower energy levels
   D) emit energy as they move to higher energy levels

4) Given the bright-line spectra of three elements and the spectrum of a mixture formed from *at least* two of these elements:



Which of these elements are present in this mixture?
   A) *D* and *G*, only
   B) *E* and *G*, only
   C) *E* and *D*, only
   D) *D*, *E*, and *G*

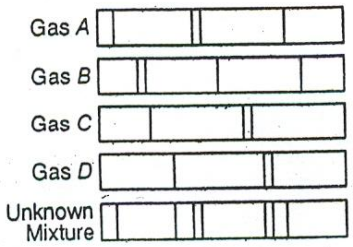
5) The diagram below represents the bright-line spectra of four elements and a bright-line spectrum produced by a mixture of two of these elements.



Which two elements are in this mixture?
   A) barium and lithium
   B) helium and hydrogen
   C) barium and hydrogen
   D) helium and lithium

Questions 6 and 7 refer to the following:

Many advertising signs depend on the production of light emissions from gas-filled glass tubes that are subjected to a high-voltage source. When light emissions are passed through a spectroscope, bright-line spectra are produced.



6) Identify the *two* gases in the unknown mixture in the given diagram.

7) Explain the production of an emission spectrum in terms of the energy states of an electron.