Key terms to choose from for Questions 1 and 2:

A. isotopes  B. element  C. protons
D. radioactivity  E. alpha decay  F. half-life
G. nuclide  H. atomic number  I. neutrons
J. electrons  K. nucleus  L. atomic mass
M. mass number  N. neutron number  O. radionuclides
P. beta decay  Q. gamma decay  R. strong nuclear force
S. nucleons

1. (2 points)
   a. Subatomic particles with a very small relative mass and a negative one charge  \( J \)
   b. The emission of a helium nucleus, \( ^{4}_{2}He \), from a nuclide \( E \)

2. (2 points) Write the letter corresponding to a key term from above that best matches each description below.
   a.  \( R \)  Fundamental force that holds the nucleus together
   b.  \( H \)  \( Z \), the number of protons in an atom of that element

3. (2 points) Circle the best answer for each of the following multiple choice questions.
   a. How many half-lives would it take for a sample of a radionuclide to decrease its activity to 1/32 of the original amount?
      i) 6  \( \underline{ii)} \) 5  iii) 16  iv) 32
   b. How many neutrons are in the nucleus of the atom \( ^{35}_{17}Cl \)?
      i) 52  ii) 35  iii) 17  \( \underline{iv)} \) 18

\( \text{Ô O V E R Û} \)
4. (2 points) Fill in the blanks below.
   
a. The collective name for neutrons and protons in the nucleus is **nucleons (or I let you get away with mass number but that’s not really a name.)**

   b. No stable nuclides exist that have Z greater than **83**.

5. (2 points) Complete the following equation:

\[
^2_1 \text{H} + ^{98}\text{Mo} \rightarrow ^{99}\text{Tc} + ^1_0 \text{n}
\]