QUIZ 1 3446 Chapter 1 Name:

1) The Thompson "plum pudding" model of the atom
   a) was supported by Rutherford's experiment
   b) replaced the Bohr model of the atom
   c) did not have a nucleus
   d) all of the above

2) In a Rutherford experiment alpha particles incident on a gold foil

   a) are typically scattered at large angles
   b) are always scattered at small angles
   c) have a tan(x/2) angular dependence
   d) are typically scattered at small angles, but are sometimes scattered at larger angles

3) In a Rutherford experiment
   a) the impact parameter becomes smaller as the alpha particle approaches the gold foil
   b) a larger impact parameter gives a larger scattering angle
   c) for a fixed impact parameter and energy, the average scattering angle is larger for a gold (Z=79) than for copper (z=29)
   d) the impact parameter decreases with the energy of the alpha particle

4) In particle physics, a Barn is
   a) a unit of impact parameter
   b) bigger than a cow
   c) a unit of cross section
   d) a unitless quantity used to measure scattering angles

5) The total cross section
   a) is smaller than the differential cross section for that process
   b) is a very upset section
   c) is like a volume
   d) can be determined by integrating the differential cross section for that process

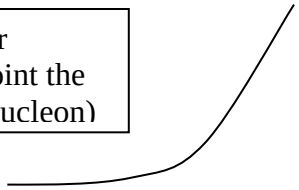
extra credit 5 points: what unit is more appropriate for the proton-proton total cross section ? nanobarns, microbarns, millibarns, or none of the adjacent.

Key CDCCD milli

QUIZ 2.2 3446 Chapter 2 Name

1) i) Sketch the binding energy vs. atomic mass (A).

Total B.E. grows rapidly as a function of A, since the binding energy per nucleon is increasing with A until it levels off at about 8 MeV; at this point the **total binding energy** increases linearly with A (with a slope of 8 MeV/nucleon)



ii) The binding energy per nucleon for large A (A>50)
   a) increases linearly with increasing A
   b) decreases linearly with increasing A
   c) is approximately constant
   d) increases linearly with a slope of 1.7A

2) i) The strong nuclear force is
   a) a long range force
   b) a short range force
   c) none of the above
   ii) and consequently
   a) the nucleus tends to collapse to a point
   b) all nuclei are unstable unless they have a lot of protons
   c) neutrons have more strong force than protons
   d) nuclei with a higher A are larger than nuclei with a smaller A

3) Which nucleus is most likely to be stable
   a) one with an even identical number of neutrons and protons
   b) one with an odd identical number of neutrons and protons
   c) one with more protons than neutrons
   d) they are all unstable

4) The nuclear potential can be approximated by a
   a) by a square well with an attractive core
   b) by a round well with a repulsive core
   c) a square well with a rotten core
   d) a square well with a repulsive core

5) Nucleons
   a) are fermions
   b) are bosons
   c) do not obey the Heisenberg Uncertainty principle
   d) do not obey the Pauli Exclusion principle

Key: CBDADA

QUIZ 3 3446 Chapter 3 Name:

1) A proton has
   a) electrons inside
   b) no spin
   c) integer spin
   d) the opposite isospin of a neutron

2) Which particle has the largest magnitude magnetic dipole moment?

   a) proton
   b) neutron
   c) electron
   d) muon

3) True or False: The main useful feature of the Liquid Drop model is describing binding energy.

4) Which model has the best success at describing magic numbers?
   a) Liquid drop model
   b) Fermi gas model
   c) Shell model
   d) Magic model

5) Which model has the best success at describing heavy nuclei?
   a) Collective model
   b) Fermi gas model
   c) Runway model
   d) Shell model

Key: DCTCA