Conservation Of Mass and Energy - _____

or _____ but can be_____ into _____ according to the formula

_____ = _____
Units( ) ( )

c - speed of _____

Mass (kg) to Energy (J) Equation

** _____ that can be obtained from _____

Since 1 AMU = _____ Kg - Plug into equation …
$E= mc^2$

E= (_____ Kg) X (_____)^2

= _____ Mev or _____ MeV
*****

1 AMU converts to _____ Mev or _____ MeV

_____ (Mass/Energy Relationship)

Typical Regents Question - How much energy can be generated when 2 amu are completely converted into energy?

Answer: _____ (each _____)

Forces inside nucleus

1) _____ - holds nucleus together

- _____

- operates at distance < 10^{-13} meters

A) Binding Energy- amount of energy needed to separate nucleons in nucleus.

Protons and neutrons in nucleus _____

_____

Mass of Assembled Nucleus < Combined mass of an equivalent # of nucleons.

Lost mass called **mass defect -** **Mass Defect = binding energy **

(mass lost is converted to energy)

Subatomic Particles – _____
See reference table – Classification of matter

Examples:

- Neutrino – no charge and less mass than electron!! (Travel close to speed of light!!!!)

  Sun produces so many neutrinos that _____ neutrinos pass through every square centimeter (0.15 sq in) of the surface of Earth every second.

- Meson – mass somewhere between an electron and proton

- Baryons relatively larger subatomic particles

ex) _____, _____ and _____ (mass greater than neutron)

Baryons are made of smaller particles called **quarks (see ref.)**

Each subatomic _____ has an "_____"

(_____)

The "antiparticle" of an _____ is called a _____