

# Assignment 8

Please type your responses into a word document, and submit that on UNM Learn. Show your work for all questions. You can take scans/pictures of your work if you put them in the word document, but don't submit them as images. Be sure to number your responses 1, 2(a), etc. so I know which question you're answering. If you get stuck, post a question on the forums. Chances are you're not the only one!

1. (5 points) Name and give an example of five different forms of energy.
2. (5 points) Briefly describe two theories that were offered for the source heat of the Sun, and explain the accepted theory for the source of the heat of the Sun.
3. (5 points) Define the atomic binding energy. Why is it a negative number? What atom has the highest (most negative) binding energy?
4. (20 points) In nuclear physics we use the notation  ${}^A_ZU$ , where  $U$  is the element (uranium in this case),  $A$  the combined number of neutrons and protons, and  $Z$  the number of protons alone. Deuterium ( ${}^2_1H$ ) fuses with tritium ( ${}^3_1H$ ) to create Helium ( ${}^4_2He$ ). The mass of deuterium is 2 u, tritium 3 u, and helium 4 u. How much energy is released in this reaction, in Joules? Use the conversion  $1\text{ u} = 1.66 \times 10^{-27}\text{ kg}$ , and the definition  $1\text{ J} = 1\frac{\text{kg m}^2}{\text{s}^2}$ .