This quiz is take-home and open book, and it is intended that all members of the group contribute to completing it. It is a violation of the Academic Honor Code to sign a quiz that you did not work on. The quiz is due at the end of class on Thursday, February 11.

List names in alphabetical order, and give social security numbers! Put names on all pages, and staple pages together

Points

1. Ethanol (C$_2$H$_5$OH) is discussed as an alternative fuel for gasoline engines.

   (2) (a) Write a balanced equation for the complete combustion of ethanol.

(3) (b) The heat produced in the combustion of one mole of ethanol is 1250 kJ. Convert this figure to heat produced per mole of CO$_2$ produced, and heat produced per gram of ethanol consumed.

2. To compare ethanol and gasoline as a fuel, consider a main constituent of gasoline as having the formula C$_8$H$_{18}$.

   (2) (a) Write a balanced equation for the complete combustion of C$_8$H$_{18}$. 
(3) 2(cont) (b) Use the bond energy method to calculate the heat produced in the reaction in part (a). Consider the structure of C$_8$H$_{18}$ as:

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H H H H H H H H
H—C—C—C—C—C—C—C—H
H H H H H H H H
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(3) (c) Calculate the heat produced from combustion of C$_8$H$_{18}$ per mole of CO$_2$ produced and per gram of C$_8$H$_{18}$ consumed.

(2) 3. Compare the results of 1(b) and 2(c) and state:

(a) Which fuel provides more energy per unit mass?

(b) Which fuel contributes more to the greenhouse effect through CO$_2$ production per unit of energy produced?