Name: _____   Date: _____

[15 pt]   1. Octane, C_8H_{18}, burns in air to form carbon dioxide and water according to the following reaction.

$$2C_8H_{18}(l) + 25O_2(g) \longrightarrow 16CO_2(g) + 18H_2O(g) + 10{,}900 \text{ kJ}$$

(a) How many grams of CO_2 are produced when 10.0 grams of C_8H_{18} are combusted? 1(a) _____

(b) How many grams of O_2 gas are consumed to produce 530.0 grams of H_2O? 1(b) _____

(c) How many grams of C_8H_{18} must be combusted to produce 25.0 kg of CO_2? 1(c) _____

(d) How many kJ of energy is created when 100.0 grams of C_8H_{18} are combusted? 1(d) _____

(e) How many grams of products can be produced from burning 53.75 grams of C_8H_{18}? 1(e) _____

                    .   1(e) _____

[15 pt]   2. In a blast furnace, iron (III) oxide reacts with coke (carbon) to produce molten iron and carbon monoxide.

(a) Write the balanced reaction described above. Be sure to include the states of known materials.

(b) How many grams of carbon are required to react with 15.0 grams of iron (III) oxide?   2(b) _____

(c) How many grams of Iron (III) oxide are required to produce 10.0 kg of Iron?   2(c) _____

(d) How many kilograms of carbon monoxide are produced for every 1.0 kilograms of of Iron produced?   2(d) _____

(e) How many grams of Iron can be produced from 1.0 kg of Iron (III) Oxide?   2(e) _____