CHEM 1105 TEST#1

NAME: **Date: July 4, 2016**
Student Number:

1. Using Hess's law calculate ΔH for the reaction

$$N_2H_4(l) + 2H_2O_2(l) \rightarrow N_2(g) + 4H_2O(l) \qquad \Delta H = ?\ kJ$$

Given these reactions and their ΔH's.

1. $N_2H_4(l) + O_2(g) \rightarrow N_2(g) + 2H_2O(l)$ ΔH = -622.2kJ
2. $2H_2O(l) \rightarrow 2H_2(g) + O_2(g)$ ΔH = +571.6 kJ
3. $H_2O_2(l) \rightarrow H_2(g) + O_2(g)$ ΔH = +187.8 kJ

2. Use the given standard enthalpies of formation values to calculate ΔH° for the following:

$$2Fe_2O_3(s) + 3Si(s) \rightarrow 3SiO_2(quartz) + 4Fe(s) \qquad \Delta H° = ?$$

Compound	$\Delta H_f°$(kJ/mole)
Fe(s)	0
$Fe_2O_3(s)$	-824.2
Si(s)	0
SiO_2(quartz)	-910.9

3. A 0.828 g sample of gasoline is burned in a bomb calorimeter with a heat capacity of 9.89 kJ/°C. The temperature in the calorimeter rises from 22.75 °C to 26.37°C. Calculate the heat of combustion of gasoline, in kilojoules per gram.

$$-q_{rxn} = q_{cal} \qquad q_{cal} = C_{cal}\Delta t$$

Answer Set for CHEM 1105 TEST#1

1. -818.2 kJ

2. -1085 kJ

3. -43.2 kJ/g