The University of Jordan
Faculty of Engineering & Technology
Chemical Engineering Department

(0905421) Chemical Reaction Engineering I **First Semester – 2014/2015**

Quiz # 7 (Chapter 8)

Name: _____ ID # _____

a) Calculate ΔH^o_{Rx}, ΔC_P , and $\Delta H_{Rx}(400\ K)$ for the reaction $A + B \rightarrow 2C$ from the information provided in the following table:

Compound (i)	Heat of formation (H_i^o (298 K)) kcal/mol	Specific heat capacity (C_{Pi}) cal/(mol.°C)
A	-100	80
B	-40	20
C	-30	30

b) The reaction in part (a) was run adiabatically in a CSTR. An equimolar feed in A and B enters at 400 K. Calculate the steady-state reactor temperature if it reached 60% conversion.

Info: For constant heat capacities, the general adiabatic energy balance for any reaction is

$$T = T_o - \frac{X[\Delta H_{Rx}(T_o)]}{\sum \theta_i C_{Pi} + X\Delta C_P}$$

c) If the feed was changed to an equimolar feed in A, B and an inert E (C_{PE} = 190 cal/(mol.°C), will the reactor steady-state temperature change? If yes, why? And what is the new temperature?