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**Question (1)**

(6 marks)

**Complete the following statement**

- (a) One Joule (1.00 J) is equivalent to .....calories.
- (b) The internal energy of a system can be increased by .....
- (c) ..... is a state function, that is, a change in this quantity depends only  
on the initial and final states of the system being discussed.
- (d) The internal energy of a system is the sum of all .....and .....  
energies of its component parts
- (e) A.....  $\Delta H$  corresponds to a..... process.
- (f) The standard enthalpy of a reaction is defined as .....
- .....

**Question (2)**

(2 marks)

Calculate the amount of heat  $q$  for an endothermic process in which the system receives 12J of work from its surrounding and the change of internal energy is 77J.

**Question (3)**

(4 marks)

When 5.8 g acetone  $C_3H_6O_{(l)}$  is burned at  $25^\circ C$  in a constant pressure system with an excess oxygen carbon dioxide and liquid water are formed and 42.739 kcal of heat is given off

- (i) Formulate this reaction as thermochemical equation.
- (ii) Is the reaction exothermic or endothermic?
- (iii) Calculate the internal energy change ( $\Delta E$ ) for this reaction.

**Question (4)**

(3 marks)

Calculate  $\Delta H$  for the reaction of formation of the toxic gas carbon monoxide from the elements  $C_{(s)} + \frac{1}{2}O_{2(g)} \rightarrow CO_{(g)}$   $\Delta H = ?$

Given that:

