**Question (2) (22 Marks )**

1. Define each of the following:
2. The first law of thermodynamics.
3. Bond enthalpy.
4. Molar heat capacity.
5. Thermochemical equation.

(b) Calculate the amount of heat q for the following processes:

(i) An endothermic process in which the system receives 12J of work from its surrounding and the change of internal energy is 77J .

(ii) Converting 55 g of ethanol from liquid to vapor at its boiling point if the heat of vaporization is 38.5 KJ/mole.

(iii) Increasing the temperature of 100 g of copper from to the specific heat of copper is .

(c) Standard heat of formation  of , and  are, , and  respectively. Determine the heat of combustion of one mole of 

**.**

(d) Calculate the standard molar enthalpy of formation of  using the following standard enthalpies of reaction:



1. If, at 25°C. Calculate Δ*H* for the reaction

