**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 $C\_{2}H\_{5}OH$ 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 $10℃$ to $100℃$ the specific heat of copper is $0.389 J/g ℃$.

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

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 (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

 