

Open Response {23 points: Point allocation is shown in each part of the question}

Show all of your work to get full credit.

Irrespective of the actual point value of a question, there will be a

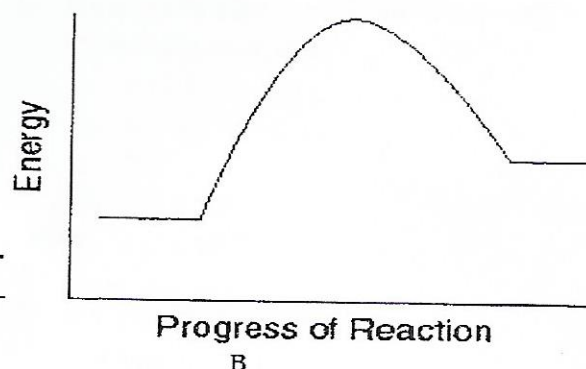
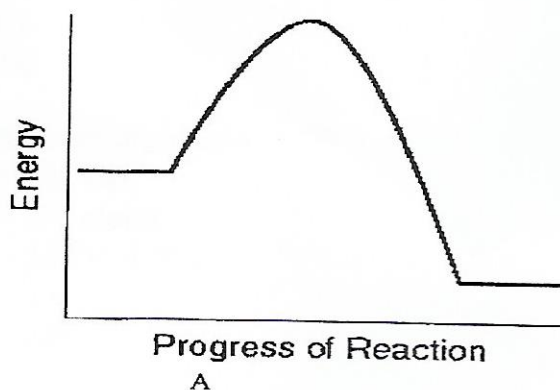
- **0.5 point penalty** for each occurrence of the following:
 - failing to include a zero prior to a decimal point for a number less than 1
 - failing to include a unit with a number
 - incorrect significant figures in final answer
- **1 point penalty** for each occurrence of the following:
 - missing equality {you cannot use a conversion factor without knowing its equality}

48. When pentane (C_5H_{12}) burns in oxygen gas, the products are carbon dioxide, water and heat.

a. What type of chemical reaction is this? (1 pt)

- i. An exothermic combination reaction
- ii. An endothermic decomposition reaction
- iii. An exothermic combustion reaction.
- iv. An endothermic combination reaction
- v. An exothermic decomposition reaction

b. Diagrams A and B are energy profiles that represent a chemical reaction.



Which diagram is representative of the reaction in this question? (2 pt)

- i. Diagram A
- ii. Diagram B

c. Heat of reaction is (1 pt)

- (i) total energy output from the reaction
- (ii) net energy change of the reaction

d. On your chosen diagram, identify and label the area that corresponds to:

- (i) energy of activation (1.5 pt)
- (ii) heat of reaction (1.5 pt)

e. For this reaction, the heat of the reaction (ΔH) has a _____ value (1 pt)

- i. positive
- ii. negative