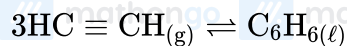


## Questions with Answer Keys

MathonGo

## Q1: 24 Feb (Shift 2) - Numerical

Assuming ideal behaviour, the magnitude of  $\log K$  for the following reaction at  $25^\circ\text{C}$  is  $x \times 10^{-1}$ . The value of  $x$  is \_\_\_\_\_. (Integer answer)

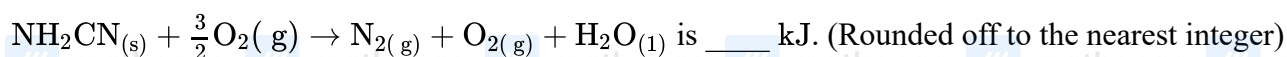


[Given :  $\Delta_f G^\circ(\text{HC} \equiv \text{CH}) = -2.04 \times 10^5 \text{ J mol}^{-1}$ ;  $\Delta_f G^\circ(\text{C}_6\text{H}_6) = -1.24 \times 10^5 \text{ J mol}^{-1}$

$$R = 8.314 \text{ J K}^{-1} \text{ mol}^{-1}]$$

## Q2: 25 Feb (Shift 1) - Numerical

The reaction of cyanamide,  $\text{NH}_2\text{CN}_{(s)}$  with oxygen was run in a bomb calorimeter and  $\Delta U$  was found to be  $-742.24 \text{ kJ mol}^{-1}$ . The magnitude of  $\Delta H_{298}$  for the reaction



[Assume ideal gases and  $R = 8.314 \text{ J mol}^{-1} \text{ K}^{-1}$ ]

## Q3: 25 Feb (Shift 2) - Numerical

Five moles of an ideal gas at  $293 \text{ K}$  is expanded isothermally from an initial pressure of  $2.1 \text{ MPa}$  to  $1.3 \text{ MPa}$  against a constant external  $4.3 \text{ MPa}$ . The heat transferred in this process is \_\_\_\_  $\text{kJ mol}^{-1}$ . (Rounded-off to the nearest integer) [Use  $R = 8.314 \text{ J mol}^{-1} \text{ K}^{-1}$ ]

## Q4: 26 Feb (Shift 1) - Numerical

For a chemical reaction  $A + B \rightleftharpoons C + D$  ( $\Delta_r H^\ominus = 80 \text{ kJ mol}^{-1}$ ) the entropy change  $\Delta_r S^\ominus$  depends on the temperature  $T$  (in  $\text{K}$ ) as  $\Delta_r S^\ominus = 2T$  ( $\text{J K}^{-1} \text{ mol}^{-1}$ )

Minimum temperature at which it will become spontaneous is \_\_\_\_  $\text{K}$ .

Questions with Answer Keys

MathonGo

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**Answer Key**

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**Q1 (855)**                      **Q2 (741)**                      **Q3 (15)**                      **Q4 (200)**

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