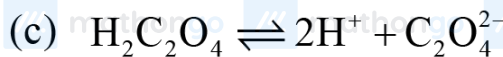
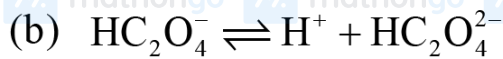
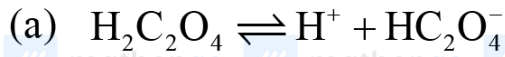


## Questions

MathonGo

## Q1 - 25 July - Shift 2

$K_{a_1}$ ,  $K_{a_2}$  and  $K_{a_3}$  are the respective ionization constants for the following reactions (a), (b), and (c).



The relationship between  $K_{a_1}$ ,  $K_{a_2}$  and  $K_{a_3}$  is given as



Space for your notes:

## Q2 - 26 July - Shift 1

At 298 K, the equilibrium constant is  $2 \times 10^{15}$  for the reaction :



The equilibrium constant for the reaction



is  $x \times 10^{-8}$ . The value of x is \_\_\_\_\_.

(Nearest Integer)

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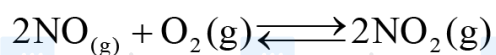
## Q3 - 28 July - Shift 2

#MathBoleTohMathonGo

## Questions

MathonGo

At 600K, 2 mol of NO are mixed with 1 mol of O<sub>2</sub>.



The reaction occurring as above comes to equilibrium under a total pressure of 1 atm.

Analysis of the system shows that 0.6 mol of oxygen are present at equilibrium. The equilibrium

constant for the reaction is         . (Nearest integer).

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#MathBoleTohMathonGo

Questions

MathonGo

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**Answer Key**

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**Q1 (D)****Q2 (2)****Q3 (2)**

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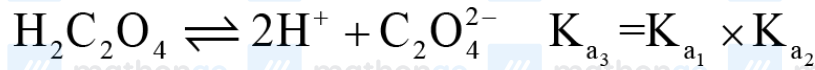
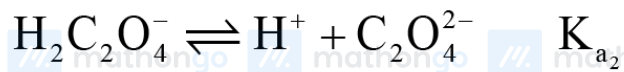
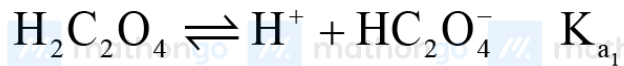
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**#MathBoleTohMathonGo**

## Hints and Solutions

MathonGo

Q1 (D)



Q2 (2)

$$K'_{\text{eq}} = \frac{1}{\sqrt{K_{\text{eq}}}} = \frac{1}{\sqrt{2 \times 10^{15}}} = x \times 10^{-8}$$

$$\Rightarrow \frac{1}{\sqrt{20}} \times \frac{1}{10^7} = x \times 10^{-8}$$

$$\Rightarrow \frac{1}{\sqrt{20}} \times 10^{-7} = x \times 10^{-8}$$

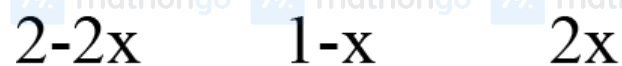
$$\frac{10}{\sqrt{20}} = x$$

$$\Rightarrow x = \frac{\sqrt{10}}{\sqrt{2}} = \sqrt{5} = 2.236$$

$$\approx 2.24$$

Q3 (2)

#MathBoleTohMathonGo



$$K_p = \frac{\left(\frac{0.8}{2.6}\right)^2}{\left(\frac{1.2}{2.6}\right)^2 \left(\frac{0.6}{2.6}\right)} = 1.925$$