

JEE MAIN EQUILIBRIUM — DEGREE OF DISSOCIATION PROBLEMS AND VAPOUR DENSITY — PYQS

Max. Marks: 24
Questions: 6

Section A (MCQ) — 4 questions

Q.1 Given is a concentrated solution of a weak electrolyte A_xB_y of concentration 'c' and dissociation constant 'K'. The degree of dissociation is given by :

[JEE Main 2026 (Online) 6th April Evening Shift]

(1) $[K \times c^{x+y-1} x^x y^y]^{x+y}$

(2) $\left(\frac{K}{c^{x+y-1} x^x y^y}\right)^{\frac{1}{x+y}}$

(3) $\left(\frac{c^{x+y-1} x^x y^y}{K}\right)^{x+y}$

(4) $\left(\frac{c^{x+y-1} x^x y^y}{K}\right)^{\frac{1}{x+y}}$

Scan or tap for the full solution



Q.2 The reaction $A(g) \rightleftharpoons B(g) + C(g)$ was initiated with the amount 'a' of A(g). At equilibrium it is found that the amount of A(g) remaining is (a - x) at a total pressure of p.

The equilibrium constant K_p of the reaction can be calculated from the expression :

[JEE Main 2026 (Online) 5th April Evening Shift]

(1) $\frac{x^2}{a^2 + x^2} \times p$

(2) $\frac{x^2}{a^2 - x^2} \times p$

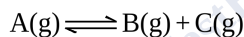
(3) $\frac{a + x^2}{x^2} \times p$

(4) $\frac{a^2 - x^2}{x^2} \times p$

Scan or tap for the full solution



Q.3 Consider the following chemical equilibrium of the gas phase reaction at a constant temperature :



If p is the total pressure, K_p is the pressure equilibrium constant and α is the degree of dissociation, then which of the following is true at equilibrium?

[JEE Main 2025 (Online) 2nd April Evening Shift]

- (1) If K_p value is extremely high compared to p, α becomes much less than unity
- (2) When p increases, α increases
- (3) If p value is extremely high compared to K_p , $\alpha \approx 1$
- (4) When p increases, α decreases

Scan or tap for the full solution



Q.4 At temperature T, compound $AB_{2(g)}$ dissociates as $AB_{2(g)} \rightleftharpoons AB_{(g)} + \frac{1}{2}B_{2(g)}$ having degree of dissociation x (small compared to unity). The correct expression for x in terms of K_p and p is:

[JEE Main 2025 (Online) 29th January Morning Shift]

(1) $\sqrt{K_p}$ (2) $\sqrt[3]{\frac{2K_p^2}{p}}$ (3) $\sqrt[3]{\frac{2K_p}{p}}$ (4) $\sqrt[4]{\frac{2K_p}{p}}$

Scan or tap for the full solution



Section B (Numerical) — 2 questions

Q.5 For the following gas phase equilibrium reaction at constant temperature,



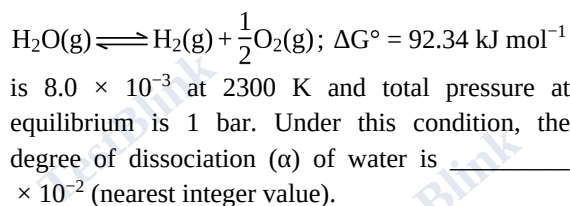
if the total pressure is $\sqrt{3}$ atm and the pressure equilibrium constant (K_p) is 9 atm, then the degree of dissociation is given as $(x \times 10^{-2})^{-1/2}$. The value of x is _____. (nearest integer)

[JEE Main 2026 (Online) 23rd January Morning Shift]

Scan or tap for the full solution



Q.6 The equilibrium constant for decomposition of $H_2O(g)$



[Assume α is negligible with respect to 1]

[JEE Main 2025 (Online) 8th April Evening Shift]

Scan or tap for the full solution



ANSWER KEY**Section A (MCQ) — 4 questions**

Ques.	1	2	3	4								
Ans.	2	2	4	2								

Section B (Numerical) — 2 questions

Ques.	5	6						
Ans.	125	5						