

33. Previous Year Question Strategy

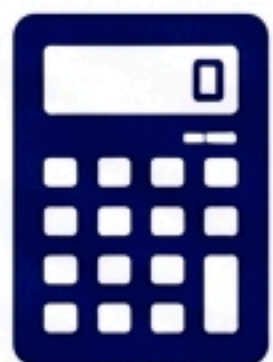


$$K_c = \frac{[C]^c [D]^d}{[A]^a [B]^b}$$

How JEE Frames Equilibrium Questions

Master the patterns, avoid the traps, and secure your rank.

The JEE Equilibrium Matrix



Formula Based

Direct application of equilibrium constants.

$$K_p = K_c (RT)^{\Delta n}$$



Concept Based

Theoretical understanding of dynamic systems.

Differentiating physical vs. chemical equilibria.



Graph Based

Visualizing concentration/pressure changes over time.

Tracking Q_c as it approaches K_c .



Application Based

Real-world industrial processes or biological buffers.

Optimizing Haber's Process yields via Le Chatelier.

Target Zones: Where the Marks Are



Kp/Kc Relationships



Le Chatelier's Principle (Stress & Shift)



pH Calculations (Weak Acids/Bases)



Buffer Solutions & Common Ion Effect



Ksp (Solubility Product)

Formula Bank

$$K_p = K_c(RT)^{\Delta n}$$

$$\text{pH} = -\log[\text{H}_3\text{O}^+]$$

$$K_w = [\text{H}_3\text{O}^+][\text{OH}^-] = 10^{-14}$$

$$K_{sp} = [\text{S}][\text{fS}]$$



**You've Learned the Theory.
Let's Test Them Now.**

$$E=mc^2$$



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- » Practice Unlimited MCQs for NEET & JEE
- » Get Clear Explanations, Not Just Marks
- » Track Your Performance Smarter



The 3-Step Attack Plan

Step 1: Identify

What is the system?

Is it Homogeneous or Heterogeneous?
Is it Acid/Base or Solubility?



Step 2: Translate

Convert text to math.

Map the given stresses (e.g., 'volume halved') to their chemical consequences (e.g., 'pressure doubled').



Step 3: Solve

Execute the framework.

Apply ICE (Initial, Change, Equilibrium) tables or directly compare reaction quotient Q_c vs. K_c .

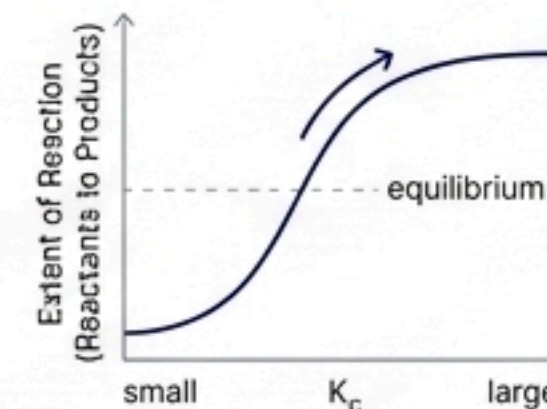
Decoding Recurring Exam Patterns

Pattern 1: Predict direction

Given initial concentrations, calculate reaction quotient Q_c .

Takeaway

If $Q_c < K_c$, reaction shifts Forward.
If $Q_c > K_c$, it shifts Backward.



Pattern 2: Calculate equilibrium constant

Given partial pressures, relate standard state to dynamic state.

Takeaway

Use stoichiometries accurately as exponents (e.g., $K_c = \frac{[C]^c [D]^d}{[A]^a [B]^b}$).

Pattern 3: Find pH

Dealing with weak electrolytes or salt hydrolysis.

Takeaway

Identify the primary reaction vs. subsidiary reaction (highest K_a).

Mind the Gap: Cognitive Traps



Wrong: Memorise PYQs only

Believing that memorizing the numerical answer of a past question will help when JEE tweaks the stoichiometric coefficients (which fundamentally alters K_c to $1/K_c$ or K_c^n).



Correct: Understand recurring concepts

Focus on the Le Chatelier mechanism. If you understand why adding an inert gas at constant pressure shifts equilibrium, you can solve any structural variation.

The Ultimate Exam Snapshot





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