

PYQSide

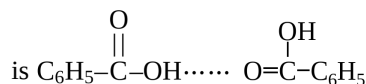
JEE MAIN SOLUTIONS — ABNORMAL MOLAR MASS AND ABNORMAL COLLIGATIVE PROPERTIES — PYQS

Max. Marks: 28

Questions: 7

Section A (MCQ)

- Q.1** Which of the following statements are not correct?
- For water, magnitude of K_b is more than the magnitude of K_f .
 - The elevation in boiling point of water when a non-volatile solute is added to it is larger in magnitude than its depression in freezing point.
 - Osmotic pressure measurement is preferred over any other colligative property to determine molar mass of proteins and polymers.
 - The dimerised form of benzoic acid in benzene



Choose the correct answer from the options given below : [JEE Main 2026 (Online) 8th April Evening Shift]

- (1) A and B only (2) A and D only
(3) A, B and D only (4) A, C and D only

Scan or tap for the full solution



- Q.2** 19.5 g of fluoro acetic acid (molar mass = 78 g mol⁻¹) is dissolved in 500 g of water at 298 K. The depression in the freezing point of water was 1°C. What is K_a of fluoro acetic acid ? (For water, $K_f = 1.86 \text{ K kg mol}^{-1}$). Assume molarity and molality to have same values.

[JEE Main 2026 (Online) 2nd April Morning Shift]

- (1) 10^{-6} (2) 4×10^{-4} (3) 3×10^{-5} (4) 3×10^{-3}

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- Q.3** 'W' g of a non-volatile electrolyte solid solute of molar mass 'M' g mol⁻¹ when dissolved in 100 mL water, decreases vapour pressure of water from 640 mm Hg to 600 mm Hg. If aqueous solution of the electrolyte boils at 375 K and K_b for water is 0.52 K kg mol⁻¹, then the mole fraction of the electrolyte solute (x_2) in the solution can be expressed as
(Given : density of water = 1 g/mL and boiling point of water = 373 K)

[JEE Main 2026 (Online) 24th January Morning Shift]

$$(1) \frac{16}{2.6} \times \frac{W}{M}$$

$$(2) \frac{1.3}{8} \times \frac{M}{W}$$

$$(3) \frac{2.6}{16} \times \frac{M}{W}$$

$$(4) \frac{1.3}{8} \times \frac{W}{M}$$

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- Q.4** $\text{HA(aq)} \rightleftharpoons \text{H}^+(\text{aq}) + \text{A}^-(\text{aq})$

The freezing point depression of a 0.1 m aqueous solution of a monobasic weak acid HA is 0.20 °C. The dissociation constant for the acid is

Given: $K_f(\text{H}_2\text{O}) = 1.8 \text{ K kg mol}^{-1}$, molality = molarity [JEE Main 2025 (Online) 8th April Evening Shift]

- (1) 1.90×10^{-3} (2) 1.38×10^{-3}
(3) 1.1×10^{-2} (4) 1.89×10^{-1}

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- Q.5** 1.24 g of AX_2 (molar mass 124 g mol⁻¹) is dissolved in 1 kg of water to form a solution with boiling point of 100.0156°C, while 25.4 g of AY_2 (molar mass 250 g mol⁻¹) in 2 kg of water constitutes a solution with a boiling point of 100.0260°C.

$K_b(\text{H}_2\text{O}) = 0.52 \text{ K kg mol}^{-1}$

Which of the following is correct?

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

- (1) AX_2 and AY_2 (both) are completely unionised.
(2) AX_2 and AY_2 (both) are fully ionised.
(3) AX_2 is completely unionised while AY_2 is fully ionised.
(4) AX_2 is fully ionised while AY_2 is completely unionised.

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Section B (Numerical)

- Q.6** The percentage dissociation of a salt (MX_3) solution at given temperature (van't Hoff factor $i = 2$) is _____ % (Nearest integer)

[JEE Main 2025 (Online) 7th April Morning Shift]

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- Q.7** If A_2B is 30% ionised in an aqueous solution, then the value of van't Hoff factor (i) is _____ $\times 10^{-1}$.

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

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full solution



ANSWER KEY

Section A (MCQ)

Ques.	1	2	3	4	5						
Ans.	3	4	4	2	4						

Section B (Numerical)

Ques.	6	7									
Ans.	33	16									