Test in Chemistry for the Entrance Exam involves several questions with chemical calculations. The questions with chemical calculations cover the following topics: Solutions (concentrations of solution), Energetics and Ionic product of water, pH and pOH.

Example problems are listed below:

I Solutions (concentrations of solution):

How many milliliters of sodium chloride (NaCl) solution whose molar concentration is 0.2 mol/L are needed to prepare 100 mL of solution whose molar concentration is 0.05 mol/L?

a) 400
b) 250
c) 25
d) 40

The correct answer is c): 25 mL

II Energetics:

Calculate the standard enthalpy change (ΔH_r^o) for the reaction:

$NH_3(g) + HCl(g) \rightarrow NH_4Cl\ (s)$

if the standard enthalpies of formation are: $\Delta H_f^o\ NH_3(g) = -46.1$ kJ/mol, $\Delta H_f^o\ HCl(g) = -92.3$ kJ/mol and $\Delta H_f^o\ NH_4Cl(s) = -314.4$ kJ/mol.

a) +176.0 kJ/mol
b) -176.0 kJ/mol
c) -195.6 kJ/mol
d) -762.2 kJ/mol

The correct answer is b): -176.0 kJ/mol

III Ionic product of water, pH and pOH:

Calculate the pH of sodium hydroxide solution that has a pOH of 2.

a) 12
b) 2
c) 10
d) 10^{-12}

The correct answer is a): 12