Question 10: If the quadratic equations $x^2 + ax + b = 0$ and $x^2 + bx + a = 0$ ($a \neq b$) have a common root, then the value of (a+b) is

(a) 1

(b) -1

(c) 2

(d) 0

Solution:

$x^2 + ax + b = 0$ ..(i)

$x^2 + bx + a = 0$..(ii)

If α is a common root of $a_1x^2+b_1x+c_1 = 0$ and $a_2x^2+b_2x+c_2 = 0$

$\alpha^2/(b_1c_2-b_2c_1) = \alpha/(a_2c_1-a_1c_2) = 1/(a_1b_2-a_2b_1)$ ...(i)

Comparing (i) and (ii) with above equations, we get

$a_1 = 1, b_1 = a, c_1 = b$

$a_2 = 1, b_2 = b, c_2 = a$

$\Rightarrow \alpha^2/(a^2-b^2) = \alpha/(b-a) = 1/(b-a)$

$\Rightarrow \alpha = 1$

So $1/(a^2-b^2) = 1/(b-a)$

$\Rightarrow (a-b)(a+b) = (b-a)$

$\Rightarrow a+b = -1$

Hence option b is the answer.