The line joining the points A(2, 0) and B(3, 1) is rotated through an angle of 45°, about A in the anticlockwise direction. The coordinates of B in the new position

A $(2, \sqrt{2})$

B $(\sqrt{2}, 2)$

C $(2, 2)$

D $(\sqrt{2}, \sqrt{2})$

Correct option is A)

Shift true origin to A. Then coordinate will be $A' = (2-2, 0) = (0, 0)$ and $B' = (3-2, 1-0) = (1, 1)$

Now, convert it to poles form,

$r = \sqrt{2}$ and $\phi = 45^\circ$

$\therefore B' = (\sqrt{2}\cos 45^\circ, \sqrt{2}\sin 45^\circ)$

Now, rotate it by 45°.

So, new $B'' = (\sqrt{2}\cos(45^\circ + 45), \sqrt{2}\sin(45^\circ + 45^\circ) = (0, \sqrt{2})$

Now, convert it back to old coordinate $= (0 + 2, \sqrt{2}) = (2, \sqrt{2})$