

Q. 03

The component of a vector \vec{r} along X-axis will have maximum value if

- 1) \vec{r} is along positive Y-axis
- 2) \vec{r} is along negative Y-axis
- 3) \vec{r} is along positive X-axis
- 4) \vec{r} make an angle of 45° with the X-axis

Sol. \vec{r} is along positive X-axis

Let \vec{r} makes an angle θ with the positive x-axis component of r along X-axis.

$$r_x = |r| \cos \theta$$

$$(r_x)_{\text{maximum}} = |r|(\cos \theta)_{\text{maximum}}$$

$$r_x = |r| \cos \theta$$

$$= |r| \cos 0^\circ = |r| (\because \cos \theta \text{ is maximum of } \theta = 0^\circ)$$

$$\text{As } \theta = 0^\circ$$

\vec{r} is along positive x-axis