**Past Year JEE Questions**

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## Questions

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### Quetion: 01

Let $A = \begin{bmatrix} 2 & b & 1 \\ b & b^2+1 & b \\ 1 & b & 2 \end{bmatrix}$ where b > 0.

Then the minimum value of $\dfrac{\det(A)}{b}$ is -

A. $\sqrt{3}$

B. $-2\sqrt{3}$

C. $-\sqrt{3}$

D. $2\sqrt{3}$

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## Solutions

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### Solution: 01

#### Explanation

$A = \begin{bmatrix} 2 & b & 1 \\ b & b^2+1 & b \\ 1 & b & 2 \end{bmatrix}$ (b > 0)

$|A| = 2(2b^2 + 2 - b^2) - b(2b - b) + 1(b_2 - b_2 - 1)$

$|A| = 2(b^2 + 2) - b^2 - 1$

$|A| = b^2 + 3$

$\dfrac{|A|}{b} = b + \dfrac{3}{b} \Rightarrow \dfrac{b + \frac{3}{b}}{2} \geq \sqrt{3}$

$b + \dfrac{3}{b} \geq 2\sqrt{3}$