4 JEE Main 2021 (Online) 27th August Evening Shift

MCQ (Single Correct Answer)

Let $A = \begin{pmatrix} [x+1] & [x+2] & [x+3] \\ [x] & [x+3] & [x+3] \\ [x] & [x+2] & [x+4] \end{pmatrix}$, where [t] denotes the greatest integer less than or equal to t. If det(A) = 192, then the set of values of x is the interval :

A [68, 69)

B [62, 63)

C [65, 66)

D [60, 61)

Explanation

$$\begin{vmatrix} [x+1] & [x+2] & [x+3] \\ [x] & [x+3] & [x+3] \\ [x] & [x+2] & [x+4] \end{vmatrix} = 192$$

$R_1 \to R_1 - R_3$ & $R_2 \to R_2 - R_3$

$$\begin{bmatrix} 1 & 0 & -1 \\ 0 & 1 & -1 \\ [x] & [x]+2 & [x]+4 \end{bmatrix} = 192$$

$$2[x] + 6 + [x] = 192 \Rightarrow [x] = 62$$