Solution

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Given $f(x) = (x-1)^2 + 3 = x^2 - 2x + 1 + 3 = x^2 - 2x + 4$

I. $2f(x) = f(x-1) + f(x+1)$

RHS $\Rightarrow$ $f(x-1) = (x-1-1)^2 + 3 = (x-2)^2 + 3 \Rightarrow x^2 - 4x + 7$

$f(x+1) = (x+1-1)^2 + 3 = x^2 + 3$

So, $f(x-1) + f(x+1) = 2x^2 + 10 - 4x$

LHS $\Rightarrow$ $2f(x) = 2x^2 - 4x + 8$

So LHS $\neq$ RHS

II $f(2-x) = f(x)$

LHS $\Rightarrow$ $f(2-x) = (2-x-1)^2 + 3 = (1-x)^2 + 3$

$= (x-1)^2 + 3$

Here LHS = RHS

So II is true

III $f(x) = f(-x)$

RHS $\Rightarrow$ $f(-x) = (-x-1)^2 + 3 = (x+1)^2 + 3$

RHS $\neq$ LHS, So III is wrong

Ans B