56. Solution: C

Let Y represent the payment made to the policyholder for a loss subject to a deductible D.

That is $Y = \begin{cases} 0 & \text{for } 0 \le X \le D \\ x - D & \text{for } D < X \le 1 \end{cases}$

Then since E[X] = 500, we want to choose D so that

$$\frac{1}{4}500 = \int_D^{1000} \frac{1}{1000}(x-D)dx = \frac{1}{1000}\frac{(x-D)^2}{2}\Big|_D^{1000} = \frac{(1000-D)^2}{2000}$$

$(1000 - D)^2 = 2000/4 \cdot 500 = 500^2$

$1000 - D = \pm 500$

D = 500 (or D = 1500 which is extraneous).