# Answer: (C) the expected y value when x is zero

In a simple linear regression model represented as Y = β₀ + β₁X + ε, the intercept (β₀) is the expected value of Y when X equals zero.

This can be clearly seen by substituting X = 0 into the regression equation:

Y = β₀ + β₁(0) + ε

Y = β₀ + ε

Taking the expectation:

E[Y|X=0] = E[β₀ + ε] = β₀

Thus, the intercept represents the expected value of the dependent variable Y when the independent variable X equals zero.

Option (A) is incorrect because the strength of the relationship between X and Y is measured by the correlation coefficient or the slope, not the intercept.

Option (B) confuses the roles of X and Y; the intercept gives us information about Y when X is zero, not vice versa.

Option (D) is technically correct but too vague to be the best answer. While the intercept is indeed a population parameter (denoted as β₀), this doesn't specifically describe what the intercept represents conceptually in the regression model.