TOPIC

Engineering Probability and Statistics – Section II – Question 6

QUESTION

The table below summarizes the analysis of samples of galvanized steel for coating weight and surface roughness:

	Coating Weight (CW)	
Surface Roughness (SR)	High	Low
High	12	16
Low	88	34

The probability that a sample has high surface roughness, given it has high coating weight most nearly is

(A) 0.12
(B) 0.15
(C) 0.16
(D) 0.28

HINT

Let A and B be two events. Then the conditional probability

$$P(A \mid B) = \frac{P(A \cap B)}{P(B)}.$$

SOLUTION

There are a total of N = 150 samples. Let events
A = {samples that have high surface roughness}, and
B = {samples that have high coating weight}.
Then

N(B) = 100, and
N(A∩B) = 12.

The following probabilities can be obtained.

P(B) = 100/150, and
P(A∩B) = 12/150.

Therefore,
P(A sample has high surface roughness given it has high coating weight)

$$= P(A \mid B)$$
$$= \frac{P(A \cap B)}{P(B)}$$
$$= \frac{12/150}{100/150}$$
$$= 0.12$$

ANSWER
(A)

CONTRIBUTOR
Michael Weng