

Subject: Engineering Mathematics

DPP-09

Chapter: Probability

Topic : Correlation & Regression

1. If $\Sigma x_i = 15$, $\Sigma y_i = 36$, $\Sigma x_i y_i = 110$ and $n = 5$, then cov (x, y) is equal to
 (a) 0.6 (b) 0.5
 (c) 0.4 (d) 0.225
2. If cov (x, y) = -16.5, var (x) = 2.89 and var (y) = 100, then the coefficient of correlation r is equal to
 (a) 0.36 (b) -0.64
 (c) 0.97 (d) -0.97
3. If $\Sigma x_i = 24$, $\Sigma y_i = 44$, $\Sigma x_i y_i = 306$, $\Sigma x_i^2 = 164$, $\Sigma y_i^2 = 574$ and $n = 4$, then the regression coefficient b_{yx} is equal to
 (a) 2.1 (b) 1.6
 (c) 1.225 (d) 1.75
4. If $\Sigma x_i = 30$, $\Sigma y_i = 42$, $\Sigma x_i y_i = 199$, $\Sigma x_i^2 = 184$, $\Sigma y_i^2 = 318$ and $n = 6$, then the regression coefficient b_{xy} is equal to
 (a) -0.36 (b) -0.46
 (c) 0.26 (d) None
5. Let r be the correlation coefficient between x and y and b_{yx} , b_{xy} be the regression coefficient of y on x and x on y respectively then
 (a) $r = b_{xy} + b_{yx}$ (b) $r = b_{xy} \times b_{yx}$
 (c) $r = \sqrt{b_{xy} \times b_{yx}}$ (d) $r = \frac{1}{2}(b_{xy} + b_{yx})$
6. Which one of the following is a true statement.
 (a) $\frac{1}{2}(b_{xy} + b_{yx}) = r$ (b) $\frac{1}{2}(b_{xy} + b_{yx}) < r$
 (c) $\frac{1}{2}(b_{xy} + b_{yx}) > r$ (d) None of these
7. If $b_{yx} = 1.6$ and $b_{xy} = 0.4$ and θ is the angle between two regression lines, then $\tan \theta$ is equal to
 (a) 0.18 (b) 0.24
 (c) 0.16 (d) 0.3
8. If cov (X, Y) = 10, var(X) = 6.25 and var(Y) = 31.36, then $\rho(X, Y)$ is
 (a) $\frac{5}{7}$ (b) $\frac{4}{5}$
 (c) $\frac{3}{4}$ (d) 0.256
9. Using given data points tabulated below, a straight line passing through the origin is fitted using least squares method. The slope of the line is
- | x | y | xy | x^2 |
|---|-----|------------------|-------------------|
| 1 | 1.5 | 1.5 | 1 |
| 2 | 2.2 | 4.4 | 4 |
| 3 | 2.7 | 8.1 | 9 |
| | | $\Sigma xy = 14$ | $\Sigma x^2 = 14$ |
- (a) 0.9 (b) 1
 (c) 1.1 (d) 1.5
10. Three values of x and y are to be fitted in straight line in form $y = a + bx$ by the method of least squares. Given $\Sigma x = 6$, $\Sigma y = 21$, $\Sigma x^2 = 14$ and $\Sigma xy = 46$, values of a and b are respectively
 (a) 2 and 3 (b) 1 and 2
 (c) 2 and 1 (d) 3 and 2

Answer Key

1. (c)
2. (d)
3. (a)
4. (b)
5. (c)

6. (c)
7. (a)
8. (a)
9. (b)
10. (d)



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