

Answer on Question #75689-Physics-Molecular Physics-Thermodynamics

9 If three persons, on an average, come to a company for job interview per day, then determine the probability that less than three people have come for an interview on a given day.

Solution

The mean for Poisson random variable,

$$\mu = 3$$

$$P(X < 3) = P(X = 0) + P(X = 1) + P(X = 2) = \frac{e^{-3}}{0!} 3^0 + \frac{e^{-3}}{1!} 3^1 + \frac{e^{-3}}{2!} 3^2 = 0.4232$$

Answer: 0.4232.

10. The variation of the specific heat capacity of air with temperature is given in the following set of data:

Y: Heat Capacity

(in kJ kg⁻¹K⁻¹)

1.003 1.005 1.008 1.013 1.020 1.029

X: Temperature (in K) 250 300 350 400 450 500

Compute the correlation coefficient r_{XY}.

Solution

$$\sum X = 2250$$

$$\sum Y = 6.258$$

$$\sum X^2 = 887500$$

$$\sum Y^2 = 6.557108$$

$$\sum XY = 2364.75$$

The correlation coefficient is

$$r_{xy} = \frac{n \sum XY - (\sum X)(\sum Y)}{\sqrt{n \sum Y^2 - (\sum Y)^2} \sqrt{n \sum X^2 - (\sum X)^2}}$$
$$r_{xy} = \frac{6(2364.75) - (2250)(6.258)}{\sqrt{6(6.557108) - (6.258)^2} \sqrt{6(887500) - (2250)^2}} = 0.4967$$

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