

- Q5. The number of gamma rays emitted per second by a certain radioactive substance is a random variable having the poisson distribution with $\lambda = 5.8$. If a recording instrument becomes inoperative when there are more than 12 rays per second, what is the probability that the instrument becomes inoperative during any given second?
- Q6 A chemical company wishes to study the effect of extraction time on the efficiency of an extraction operation, obtained the data shown in table :

Extraction Time (Minutes)	Extraction Efficiency (%)
X	Y
27	57
45	64
41	80
19	46
35	62
39	72
19	52
49	77
15	57
31	68

- a. Draw a scatter plot to verify that a straight line will provide a good fit to the data, draw a straight line by eye and use it to predict the extraction efficiency one can expect when extraction efficiency is 35 minutes.
- b. Fit a straight line to the given data by the method of least square and use it to predict the extraction efficiency one can expect when the extraction time is 35 minutes.
- Q7. Write the model of the following experiments and also explain their components:
- Factorial experiments with 2 factors
 - Factorial experiments with 3 factors
 - Factorial experiments with 4 factors
- Q8. Write short note on the following :
- Preparation of thesis (Discuss the content list with example)
 - Chi-square distribution.

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