**[Q1] Answer :**

fx(X) = ½

fy(Y) = e^-Y-Y

f(x,y) is not equal to fx(x).fx(Y) so X,Y are not independent.

Cov(X,Y) = infinity

**[Q2] Answer :**

3\*10\*0.03 + 3\*20\*0.02+6\*10\* 0.075+6\*20\*0.05+6\*20\*0.05+9\*10\*0.09+9\*10\*0.06+12\*20\*0.04+15\*10\*0.03+15\*20\*0.02 = 0.9+1.2+4.5+6+8.1+10.8+7.2+9.6+4.5+6 = 58.8

**Q[3] Answer :**

Cov(X,Y) = E(XY) - E(X)E(Y)

Cov(aX+b, cY+d) = E(aX+b)(cY+d)]-E[aX+b]E[cY+d]

Cov(aX+b, cY+d) = E[aXcY + adX + bcY +db]-(aE[X]+b(cE[y]+d)

Cov(aX+b\_cY+d) = ac E[XY] +adE[X] + bcE[Y] +bd-(acE[X]E[Y] adE[X] + bcE[Y] + bd) Cov(aX+b\_cY+d)= ac E[XY] +adE[X] bcE[Y] bd - ac E[XJE[Y]- ad E[X] -bcE[Y] - bd

Cov(aX+b.cY+d) = ac E[XY]-ac E[X]E[Y]

**[Q4] Find out the relation between Variance(X), Variance(Y), Covariance(X,Y) and Variance(X+Y).**

**Answer :**

**Variance :** The average of the squared differences from the mean…

**Covariance(X,Y) =** Covariance measures the direction of the relationship between two variables. A positive covariance means that both variables tend to be high or low at the same time. A negative covariance means that when one variable is high, the other tends to be low.

**Variance(X+Y) =**  Var(X) + Var(Y)

**[Q5] What are Outliers?**

**Answer :** when we collect data, sometimes there are values that are ‘far away’ from the main group of data…..they are called **Outliers.**

**[Q6] What happens when we increase Dimensionality of dataset?**

**Answer:** When be increase the dimentionality of dataset..it is not necessary ..our model is more accurate but it will be the cause of productivity and it will be more time taken.

**[Q7] use the given dataset to plot the asked graph and write your conclusions based on the graphs.**

**Answer:**

**https://colab.research.google.com/drive/1JnS2tdYSNVZgJBS\_Rsoaq4BcuDA2YTaC?usp=sharing**