SOLUTIONS

1. **Analytical Risk**

**Question 1.**

* **Mean and variance of joint distribution**

Given,

 with correlation

We can extend the concept of Portfolio theory to estimate the mean and variance of this joint distribution.

Assume K =

 M =

Therefore, = = ……………………………………… (1)

By definition,

Hence, ………………………………………(2)

From (1) & (2), therefore***mean of joint distribution* =**

* **To prove**

Given, the analytical expression of VaR,

This implies

With this implication of VaR and the equation derived in the first section, we can deduce

**Or**

We know that

**……..Hence Proved**

**Question 3.**

**Given**

 ,

**To Find**

Substituting in above equation, we get

In order to find the above conditional probability we have to check if & are independent.

 =

 Assuming

This implies that & are independent.

**Therefore,**

**Hence, Proved**