**Problem Statement 1:**

A test is conducted which is consisting of 20 MCQs (multiple choices questions) with every MCQ having its four options out of which only one is correct. Determine the probability that a person undertaking that test has answered exactly 5 questions wrong.

**Solution:**

Here, n = 20,

n - k = 5,

k = 20 - 5 = 15

Here the probability of success = probability of giving a right answer = **s** = 1/4

Hence, the probability of failure = probability of giving a wrong answer =1-**s** = 1 – ¼ = 3/4

When we substitute these values in the formula for Binomial distribution we get,

 C(n,k) s(power)k (1−s)(n−k)

So, P (exactly 5 out of 20 answers incorrect)

= C (20, 5) \* (¼)15 \* (¾)5

= (20\*19\*18\*17\*16)/(5\*4\*3\*2\*1)\*(1/4)15\*(3/4)5

= 0.0000034 (approximately)

Thus the required probability is 0.0000034 approximately.