

## Answer on Question #63662 – Math – Statistics and Probability

### Question

A committee of 5 is to be formed from among 6 doctors, 5 CAs, 2 MBAs and 1 Government employee. Find the probability such that

- (i) each profession is represented
- (ii) the committee has 1 Government employee and at least one MBA.

### Solution

The total amount of people is 14. Then the committee can be formed in  $C(14,5)$  ways:

$$C(14,5) = \frac{14!}{5!9!} = 2002$$

- (i) A doctor can be chosen in 6 ways, a CA in 5 ways, an MBA in 2 ways, and Government employee in 1 way. And the last free place can be occupied by one of 10 people who have not been selected previously. We have

$$P = \frac{6 \cdot 5 \cdot 2 \cdot 1 \cdot 10}{C(14,5)} = \frac{6 \cdot 5 \cdot 2 \cdot 1 \cdot 10}{2002} = \frac{600}{2002} \approx 0.2997.$$

- (ii) If there is one MBA in the committee then we reserve a place for the Government employee and a place for an MBA. Note that an MBA can be chosen in 2 ways. The other three members can be chosen from 11 people (6 doctors, 5 CAs). We have  $C(11,3)$  opportunities:

$$P_1 = \frac{1 \cdot 2 \cdot C(11,3)}{C(14,5)} \approx 0.16484.$$

If there are two MBA in the committee then we have one place occupied by the Government employee, 2 places occupied by MBAs, and have  $C(11,2)$  opportunities for the other two places.

$$P_2 = \frac{1 \cdot 1 \cdot C(11,2)}{C(14,5)} \approx 0.02747.$$

These two cases are inconsistent.

Then

$$P = P_1 + P_2 = 0.16484 + 0.02747 = 0.19231.$$

**Answer:** (i) 0.2997; (ii) 0.19231.