# Answer on Question #83192 — Math — Statistics and Probability

## Question

a) In a competitive examination. 30 candidates are to be selected. In all 600 candidates appear in a written test, and 100 will be called for the interview.
**i)** What is the probability that a person will be called for the interview?
**ii)** Determine the probability of a person getting selected if he has been called for the interview?
**iii)** Probability that person is called for the interview and is selected?

b) A medical survey was conducted in order to establish the proportion of the population which was infected with cancer. The results indicated that 40% of the population were suffering from the disease. A sample of 6 people was later taken and examined for the disease. Find the probability that the following outcomes were observed
**i)** Only one person had the disease
**ii)** Exactly two people had the disease
**iii)** At most two people had the disease
**iv)** At least two people had the disease
**v)** Three or four people had the disease

## Solution

**a.** **i)** 100 / 600 = 1/6
**ii)** 30 / 100 = 3/10
**iii)** 1/6 * 3/10 = 1/20

**b.** p = 0.4

n=6

**I.** $P(k = 1) = 6* p^1 * (1 - p)^5 = 6 * 0.4^1 * 0.6^5 = 0.1866$
**II.** $P(k = 2) = 15* p^2 * (1 - p)^4 = 15 * 0.4^2 * 0.6^4 = 0.311$
**III.** $P(k <= 2)$ =p(k=0)+p(k=1)+p(k=2)= $0.6^6 + 0.1866 + 0.311 = 0.544$
**IV.** $P(k >= 2) = 1 - p(k <=1)$ = 1 - (k=0)-p(k=1)=1 - 0.0467- 0.1866 = 0.7667
**V.** $P(k = 3) + P(k = 4) = 20* p^3 * (1 - p)^3 + 15 * p^4 * (1 - p)^2 = 0.2765 + 0.1382 = 0.4147$

**Answer: a) i)** 1/6; **ii)** 3/10; **iii)** 1/20;

**b)** **i)** 0.1866; **ii)** 0.311; **iii)** 0.544; **iv)** 0.7667; **v)** 0.4147.