Formulae Sheet

1. $b(x; n, p) = c_x^n p^x q^{n-x}$, x = 0, 1, 2, …, n

2. P (X = x) = h(x; N, n, k) =$({}_kC_x)({}_{N-k}C_{n-x})/({}_NC_n)$, $\max\{0, n-(N-k)\} \le x \le \min\{n, k\}$

3. $P(x; \lambda t) = \frac{(\lambda t)^x e^{-\lambda t}}{x!}$, x = 0, 1, 2, . . .

4. $g(x; p) = p\, q^{x-1}$, x = 1, 2, 3, · · ·

5. $b^*(x; k, p) = {}_{x-1}C_{k-1}\ p^k\, q^{x-k}$, x = k, k+1, k+2, …

6. $f(x_1, x_2, \ldots x_k; p_1, p_2, \ldots, p_k, n) = \frac{n!}{x_1! \times x_2! \ldots \times x_k!} \times p_1^{x_1} \times p_2^{x_2} \times \ldots \times p_k^{x_k}$

7. $f(x_1, x_2, \ldots, x_k; a_1, a_2, \ldots, a_k, N, n) = \{(a_1 C x_1)\ (a_2 C x_2) \ldots (a_n C x_n)\} / {}_NC_n$

8. $P(B) = \sum_{i=1}^{n} (A_i \cap B) = \sum_{i=1}^{n} P(A_i) P(B|A_i)$

9. $P(A_i|B) = \frac{P(A_i)P(B|A_i)}{\sum_{i=1}^{n} P(A_i)P(B|A_i)}$

10. Mean = $\frac{nk}{N}$

11. Variance = $\left(\frac{N-n}{N-1}\right) \times \frac{nk}{N} \times \left(\frac{N-k}{N}\right)$

12. Mean = np

13. Variance = npq

14. ${}_nP_r = \frac{n!}{(n-r)!}$

15. $\frac{n!}{n_1!n_2!\cdots nk!}$ **Or** $\binom{n}{n_1, n_2, \ldots, n_r} = \frac{n!}{n_1!n_2!\cdots n_r!}$

16. ${}_nC_r = \frac{n!}{r!(n-r)!}$

17. $(n-1)!$.