

Statistics & Probability:

$$1) \quad n(S) = 52C_3 = \frac{52 \times 51 \times 50}{3 \times 2 \times 1} = 88,400$$

$$E = 13C_1 \times 13C_1 \times 13C_1$$

$$= 13 \times 13 \times 13$$

$$= 2197$$

$$P(E) = \frac{n(E)}{n(S)} = \frac{2197}{88400} = \frac{169}{6800}$$

$$2) \quad P(n) = \frac{42}{100} \quad P(L) = \frac{54}{100}$$

$$P(d) = \frac{36}{100} \quad P(h) = \frac{12}{100}$$

$$(a) \quad P(A \cup d) = P(A) + P(d)$$

$$= \frac{42}{100} + \frac{36}{100} = \frac{78}{100} = 78\%$$

$$(b) \quad P(C \cup h) = P(C) + P(h)$$

$$= \frac{66}{100}$$

$$= 66\%$$

4) given:

Statistics & Probability:

450 Applications in 1 hour

by poisson distribution.

$$(a) \quad \lambda = \frac{450}{60}$$

$$\boxed{x = 15/2}, \quad \boxed{x = 10}$$

$$P(x=x) = \frac{e^{-15/2} \cdot (15/2)^{10}}{10!}$$

$$P(x) = \frac{e^{-15/2} \cdot (15/2)^{10}}{10!}$$

$$(b) \quad P(x=x) = \frac{e^{-15/2} \cdot (15/2)^{17}}{17!}$$

$$= 0.6321$$

$$(b) P(A) = P(A|B) \cdot P(B)$$

$$1.87 = \frac{8F}{100} = \frac{3F}{100} + \frac{5F}{100}$$

$$(c) P(C|D) = P(C) + P(D)$$

$$\frac{100}{100}$$



3)

Bag A

Red - 3

Black - 5

Bag B

White - 4

Black - 7

$$P(A) = 1/2$$

$$P(B) = 1/2$$

$$P(\text{Black} | A) = 5/8$$

$$P(\text{Black} | B) = 7/11$$

$$P\left(\frac{B}{\text{Black}}\right) = \frac{P(B) \times P\left(\frac{\text{Black}}{B}\right)}{P(A) \times P\left(\frac{\text{Black}}{A}\right) + P(B) \times P\left(\frac{\text{Black}}{B}\right)}$$

$$= \frac{1/2 \times 7/11}{[1/2 \times 5/8] + [1/2 \times 7/11]}$$

$$= \frac{7/22}{5/16 + 7/22}$$

$$= \frac{7/22}{\frac{5}{16} + \frac{7}{22}} = \frac{7/22}{\frac{222}{352}}$$

$$= \frac{7}{22} \times \frac{352}{222} = \frac{2464}{4884} = 0.5045$$

$$P\left(\frac{B}{\text{Black}}\right) = 0.5045$$

$$b) \quad z = \frac{x - \mu}{\sigma}$$

$$0.675 = \frac{x - 350870}{12405}$$

$$x = 350870 + (0.675 \times 12405)$$

$$x = 359237.045$$

$$75^{\text{th}} \text{ percentile} = 359237.045$$

$$\frac{b(B) + b(B|A)}{A} = \frac{b(B|A) \times \frac{A}{B}}{A}$$

$$\frac{1/5 \times 1/11}{[1/5 \times 1/11] + [2/5 \times 1/2]}$$

$$\frac{1/5 \times 1/11}{1/5 \times 1/11 + 2/5 \times 1/2} = \frac{1/5 \times 1/11}{1/5 \times 1/11 + 1/5}$$

$$= \frac{1/5 \times 1/11}{1/5 \times 1/11 + 1/5} = \frac{1/5 \times 1/11}{1/5 \times (1/11 + 1)} = \frac{1/11}{1/11 + 1} = \frac{1}{1/11 + 11} = \frac{1}{12.0909} = 0.0827$$

$$b(B|A) = 0.2012$$