19BEC4001
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1) $n(S) = 52C_3 = \dfrac{52 \times 51 \times 50}{3 \times 2 \times 1} = 88,400$,

$E =$ even getting 1 heart & 1 diamond & 1 spade

$\quad = 13c_1 \times 13c_1 \times 13c_1$

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

$\quad = 2197$

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

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2) Action movies = 42% $\rightarrow P(A)$

$\quad P(B) =$ Comedy movies = 54%

$\quad P(C) =$ drama movies = 36%

$\quad P(d) =$ Horror movies = 12%

(a) Either action or drama

$\quad P(A \cup C) = P(A) + P(C) - P(A \cap C)$

$\quad\quad\quad = 42 + 36 - 0$

$\quad P(A \cup C) = \dfrac{78}{100}$

b) either comedy or horror:

$$P(B \cup D) = P(B) + P(D) - P(B \cap D)$$
$$= 54 + 12 - 0$$
$$= 66/100$$

4) 450 applicants in 1 hour

(a) $\lambda = \dfrac{450}{60}$

$\lambda = 15/2 \qquad n = 10$

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

$$= 0.0858$$

(b) $$P(x = x) = \dfrac{e^{-15/2} \cdot \left(15/4\right)^{17}}{17!}$$

$$= 0.9301$$

$$= 0.9846$$

3) $\dfrac{5C_1}{12C_1} + \dfrac{7C_1}{11C_1}$

$= \dfrac{5}{12} + \dfrac{7}{11}$

$= \dfrac{5\,5+84}{132}$ $\qquad = \dfrac{\frac{1}{2} \times \frac{7}{11}}{\frac{1}{2} \times \frac{5}{12} + \frac{1}{2} \times \frac{7}{11}}$

$= \dfrac{7/11}{5/12 + 7/11}$ $\qquad = \dfrac{\overset{12}{\cancel{139}}}{\underset{139}{\cancel{139}}} \times \dfrac{7}{\underset{11}{\cancel{7}}}$

$= \dfrac{84}{139}$ u.

6) $Z = \dfrac{X - \mu}{\sigma}$

$0.675 = \dfrac{X - 350870}{12405}$

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

$X = 359237.045$

75th percentage $= 359237.045$