B. B. Sathish kumar
19BEC4188
statistics & probability

1.) S = 52 cards (without Replacement)
(3 cards Drawn)

P(one card is Diamond, one card is Heart, one card is spade)

$= P(\text{Diamond}) \times P(\text{Heart}) \times P(\text{spade})$

$= \frac{13}{52} \times \frac{13}{51} \times \frac{13}{50} = \frac{169}{10200}$

2.) Action movies = 42%
Comedy movies = 54%
Drama movies = 36%
horror movies = $\frac{12\%}{144}$

a.) P(Action (or) Drama) = P(Action) + P(Drama)

$= \frac{42}{144} + \frac{36}{144} = \frac{78}{144}$

b.) P(comedy (or) horror) = P(comedy) + P(horror)

$= \frac{54}{144} + \frac{12}{144} = \frac{66}{144}$

3.)

A		B	
Red	3	white	4
Black	5	black	7

$P(A) = 1/2 \quad P(B) = 1/2$

$P\left(\frac{Black}{A}\right) = 5/8$

$P\left(\frac{Black}{B}\right) = 7/11$

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

$$= \frac{1/2 \times 7/11}{(1/2 \times 5/8) + (1/2 \times 7/11)}$$

$$= \frac{\frac{7}{22}}{\frac{5}{16} + 7/22} = \frac{\frac{7}{22}}{\frac{110 + 112}{352}}$$

$$= \frac{24\,64}{4884}$$

6.) $Z = \frac{x - \mu}{\sigma}$

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

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

$x = 359237.045$

75^{th} percentage $= 359237.045$

4.) 450 Applications in 1 hour

By poisson Distribution

a.) $\lambda = \frac{450}{60}$

$\lambda = 15/2$, $x = 10$

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

$$= 0.0858$$

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

$$= 0.6321$$