Statistics Test :-

19BCS4048
J. Jerome Edwin

1) Sample = 52 cards (without replacement)
[3 cards Drawn]

Probability (one Diamond, one heart, one spade)

$= P(\text{Diamond}) \times P(\text{heart}) \times P(\text{Spade})$

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

Probability $= 169/10200$.

3) Bag A | Bag B

Bag A
3 Red
5 Black

Bag B
4 White
7 Black

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

$P(A, Bl) = 5/8$

$P(B, Bl) = 7/11$

$P(\text{Black})$ (or) $P(Bl)$ $= P(A \cap Bl) + P(B \cap Bl)$

$= 1/2 \times 5/8 + 1/2 \times 7/11$

$= 1/2 \left[\frac{5}{8} + \frac{7}{11}\right] = 1/2 \left[\frac{55+56}{88}\right]$

$= 1/2 \left[111/88\right]$

$\frac{P(B)}{P(Bl)} = \frac{P(B \cap Bl)}{P(Bl)} = \frac{1/2 \times 7/11}{1/2 \times \frac{111}{88}} = \frac{7}{\cancel{11}} \times \frac{\cancel{88}^{8}}{111}$

$P\left(\frac{B}{\text{Black}}\right) = 56/111$. (or) 0.5045.

2) action movies = 42%
Comedy movies = 54%
Drama movies = 36%
Horror movies = 12%

Total = 144

(a) Probability $\left.\begin{array}{l}\text{(action or} \\ \text{Drama)}\end{array}\right\} = P(\text{action}) + P(\text{drama})$

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

Probability (action or Drama) $= 78/144$.

(b) Probability $\left.\begin{array}{l}\text{(comedy or} \\ \text{Horror)}\end{array}\right\} = P(\text{comedy}) + P(\text{Horror})$

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

6) 75^{th} percentaile value $= ?$

average $= \$ 350870$

$\left.\begin{array}{l}\text{Standard} \\ \text{Deviation}\end{array}\right\} = \$ 12405$

Percentile $= \mu + z\sigma$

percentile value $=$ average $+$ (z × standard deviation)

where $z \Rightarrow z$ table value.

(z value for 75^{th} percentile $= 0.67$)

$$= 350870 + (0.67 \times 12405)$$

$$= 350870 + 8311.35$$

$\left.\begin{array}{l}75^{th}\text{ percentile} \\ \text{value}\end{array}\right\} = 359181.35.$

4) 450 applicants in 1 hour by Poisson distribution.

(a) $\lambda = \frac{450}{60} = 15/2$ $\boxed{x = 10}$

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

$$= 0.0858.$$

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

$$= 0.6321.$$