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19BEC4140
ECE - 'C'

1. Probability of diamond (one card) = $\frac{13}{52}$

Probability of heart (one card) = $\frac{13}{51}$

Probability of spade (one card) = $\frac{13}{50}$

Total Probability = $\frac{13}{52} * \frac{13}{51} * \frac{13}{50}$

= ~~0.25 + 0.254 + 0.26~~

= ~~0.764~~ 0.0165

2. action (%) = 42/100

comedy (%) = 54/100

drama (%) = 36/100

horror (%) = 12/100

a) Either action or drama = $\frac{42}{100} + \frac{36}{100}$

= $\frac{78}{100}$ = 0.78

b) Either comedy or horror = $\frac{54}{100} + \frac{12}{100}$

= $\frac{66}{100}$

= 0.66

3.

$P(A) + P(B) = \frac{1}{2}$

$P(\frac{B}{A})$ = Probability of black ball from bag A.

= $\frac{5}{8}$

$P(\frac{B}{B}) = \frac{7}{11}$

$P\left(\frac{B}{B}\right)$ = Probability the black ball from bag 6

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

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

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

$$= \frac{7/22}{222/352} = 7/22 \times \frac{352}{222}$$

$$= \frac{2464}{4884} = \boxed{0.5045}$$

4

450 applications in 1 hour

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

$\lambda = \frac{15}{2}$, $x = 10$

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

$$= 0.0858$$

~~b)~~

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

$= 0.6321$

6. $z = \dfrac{x-\mu}{\sigma}$

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

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

$x = 359237.045$

75th percentile $= \boxed{359237.375}$