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MST I

Solution 5 → Let $n(A)$ be the number of mens = 9
Let $n(B)$ be the number of women = 7

(a) → No of ways to select a committe of 5 members will be $^{9+7}C_5 = {}^{16}C_5 = \frac{16!}{5!\,11!}$

$= \frac{12 \times 13 \times 14 \times 15 \times 16 \times 11!}{5! \times 11!} = 13 \times 21 \times 16$

$= 4368$

(b) → Since we need to have 4 women

So, $^7C_4 \times {}^9C_1 = \frac{7!}{4!\,3!} \times 9 = 315$

(c) Probability that committe has 5 women

$= \frac{^7C_5}{^{16}C_5} = \frac{\text{ways to have 5 women}}{\text{Total ways to form committe}}$

$= \frac{1}{13 \times 16} = 1/208$

(d) Probability that the committe has at least 6 womens is 0 because a committe of 5 is to be form

if atleast three women = Probabilty 3 wome + Prom 4 + Prm 5 wom

$= \frac{^7C_3 \times {}^9C_2 + {}^7C_4 \, {}^9C_1 + {}^7C_5}{^{16}C_5}$

(c) Probability that committee has at least three men

= Probability that has three men +
Probability that has 4 men. +
Probability that has 5 men,

$$= \frac{{}^9C_3 \times {}^7C_2 + {}^9C_4 \times {}^7C_1 + {}^9C_5}{{}^{16}C_5}$$

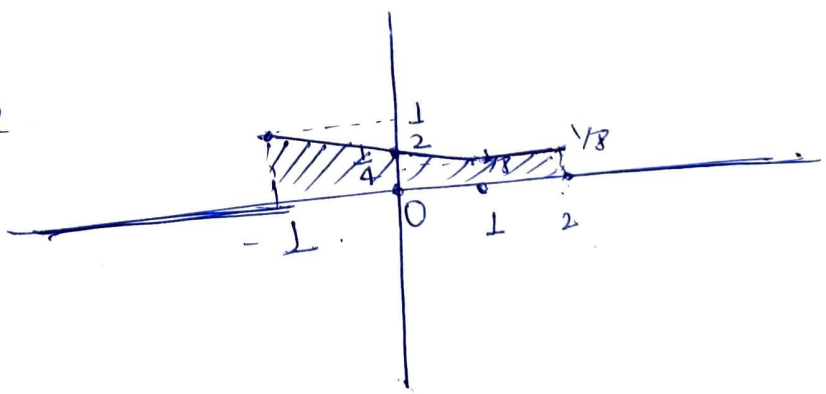
Sol → 2 No, the events are not independent

(i) Probability first card is heart $= \frac{13}{52} = \frac{1}{4}$.

(ii) Probability that second card is picture card.

$$= \frac{\text{No. of picture cards}}{51}.$$

Sol → 3 Given → $Y = 2X + 1$



Area under curve

$$= 1/8 + \frac{1}{8} + \frac{1}{2} \times 1 \times \frac{1}{8}$$

$$+ \frac{1}{2}\left(\frac{1}{4} + \frac{1}{2}\right) \times 1$$

$$= 1/8 + 1/8 + \frac{1}{16} + \frac{3}{8} = \frac{2+2+1+6}{16} = 11/16.$$

Sol → 2 Total Bulbs = 20

Each has probability of 0.2 for working more than 3 months

Total – Probability when 5 not working for atleast 3 months.