Ex-2. Two candidates A and B appeared for an interview for two vaccancies. The probabilities of their selection are $\frac{1}{4}$ and $\frac{1}{3}$ respectively. What is the probability that only one of them will be selected.

Soln -

A → Event of selection of A is E_1 → $P(E_1) = \frac{1}{4}$ ✓ → $P(E_1^c) = 1 - P(E_1) = 1 - \frac{1}{4} = \frac{3}{4}$ (non selection of A) ✓

B → Event of selection of B is E_2 → $P(E_2) = \frac{1}{3}$ ✓ → $P(E_2^c) = 1 - P(E_2) = 1 - \frac{1}{3} = \frac{2}{3}$ ✓

vaccancies - 2.

All are independent events of selection procedure,

Only one is selected ⇒ (i) A is selected but B is not selected (*) (ii) A is not selected but B is selected } (1)

$P(A \cap B) = P(A) \cdot P(B)$

$P(E_1 \cap E_2^c) \cup P(E_1^c \cap E_2)$ ⇒ only one is selected.

$\Rightarrow P(E_1) \cdot P(E_2^c) + P(E_1^c) \cdot P(E_2) = \frac{1}{4} \times \frac{2}{3} + \frac{3}{4} \times \frac{1}{3}$

$= \frac{5}{12}$ A ✓

Ex-3. A no. is chosen at random from the first 50 +ve integers., find the probability that the chosen no. is divisible by 4 or 5.

HW

Ex-4. Probabilities of solving a problem by 3 students, A, B, C, are $\frac{2}{7}, \frac{3}{8}, \frac{1}{2}$ respectively. If all of them try independently find the probability that the problem is solved. and also find the probability that the problem could not be solved.

HW

Ex-5. A bag contains 6 red and 4 white balls, 2 balls are drawn at random one after another, find the probability that both the drawn balls are white * when: i) first drawn ball is not replaced before second drawing. ii) 1st drawn ball is replaced before 2nd drawing.

(*) without replacement ⇒ Total no. of sample sp. is decreasing after each trial.

6R+4W = 10 → 1st one + 2nd another one → P(event B in 2nd trial we also get another white ball.)

P(A) = $\frac{4W_{1W}}{10C_1} = \frac{4}{10} = \frac{2}{5}$

[P(occurance of B) = P(B/A) = $\frac{3C_1}{9C_1}$

event in A

$\frac{4}{10} \times \frac{3}{9}$ = P(A) · P(B/A) now the successful event of occurance = $P(A \cap B) = P(A) \cdot P(B/A)$

$= \frac{2}{5} \times \frac{3}{9}$

$= \frac{2}{15}$.

(ii) with replacement. $P(A \cap B)$

independent events of A and B simultaneously. = $P(A) \cdot P(B) = \frac{4}{10} \cdot \frac{4}{10}$

$= \frac{2}{5} \cdot \frac{2}{5} = \frac{4}{25}$ A.

*Ex-6. 40% of the students in a class are girls. of 50% and 70% boys and girls respectively of the class pass a certain test, What is the probability that a randomly selected student from the class will have passed the test.

Ex-7. In a pack of 10 watches 3 are known to be defective. If two watches are selected at random from the pack, then what is the probability that at least one is defective.

Ex-8 *. A box contains 5 defective and 10 non-defective lamps. 8 lamps are drawn at random in succession without replacement. What is the probability that the 8th lamp is 5th defective.

$l_1\ l_2\ l_3\ l_4\ l_5\ l_6\ l_7\ l_8\ l_9\ l_{10}$

$D_1\ D_2\ D_3\ D_4\ D_5$

8th lamp = 5th Defective.

1 2 3 4 5 6 7 8

8 1 2 3 6 5 4 7

= 1 2 3 8 6 4 7 5 2

(8) 1 2 3 4 3 7 8 5 2

1st 2nd 3rd 4th 5th 6th 7th 8th

$^5C_4$ ways · × $^{10}C_3$ ways · × $\frac{1}{8}$ * → D_5 → D_5 → 8th = l_{10}

$^{15}C_8$

$\frac{^5C_4 \times {}^{10}C_3 \times \frac{1}{8}}{^{15}C_8} = ?$

$D_5\ l_4\ l_1\ D_1\ D_2\ D_3\ D_4\ l_2\ l_3$

→ without replacement → Simultaneous events occurs at a time.

$\frac{10C_3 \times 5C_4 \times \frac{1}{8}}{15C_8}$

$\frac{1}{8} \quad ^5C_4$

8 → 1 → $\frac{1}{8}$

7 → $^5C_4$ → 7-4 = 3

3 → $^{10}C_3$.