

Assignment 3

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Section: 04

Answer to the question no 1

Let,

Face cards = F

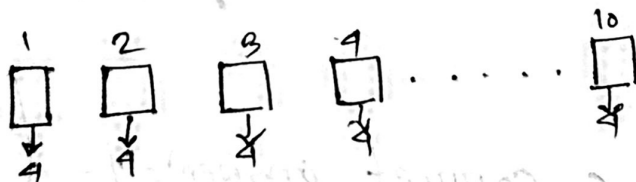
$$\therefore P(F) = \frac{12}{52}$$

Not a Face card = N

$$\therefore P(N) = 1 - \frac{12}{52} = \frac{40}{52}$$

$$P(\text{at least one face card}) = 1 - \left(\frac{40}{52} \times \frac{39}{51} \times \frac{38}{50} \times \frac{37}{49} \right)$$
$$= \frac{2759}{4165} \text{ (Ans)}$$

Answer to the question no 2



N = 4 students get A and 3 students get C

$$\therefore P(N) = \frac{10!}{4! \times 3!} \times \frac{1}{4} = \frac{1575}{65536} \text{ (Ans)}$$

Answers to the question no 3

②

An answer can be answer is 77 ways.

$$P(\text{correct answer}) = \frac{1}{17}$$

$$P(\text{correct answer}) = \frac{1}{17}$$
$$P(\text{exactly 6 correct answer}) = \frac{{}^9C_6 \times 6^3}{17^9} \quad (\text{Ans})$$

6

$$P(\text{exactly 17 correct answers}) = \frac{9C_{17} \times 6^1}{7^9}$$

$$P(1, 8, 11, 14) = \frac{9C8 \times 6}{17^9}$$

$$P(u \rightarrow u \mid u) = \frac{9}{17}$$

$P(\text{at most 6 correct answer}) = 1 - \left(\frac{{}^9C_7 \times 6^7 + {}^9C_8 \times 6^8 + {}^9C_9}{7^9} \right)$

Am

Answer to the question NO 4

no one has the same birth day $(1-P) = 0.6$

$$P(\text{no one has the same birth day}) = 0.4$$

$$P(\text{no one has the same birth day}) = 365 \times 364 \times \dots \times 340$$

$$P(\text{no one has the same birth day}) = \frac{365 \times 364 \times 363 \times \dots \times 340}{365^{26}} = 0.4018$$

\therefore Maximum number of people in gathering in such a

way that the P (two people having same birthday) doesn't

exceed 60% = 26 days Ans

Answer to the question no 5

(a)

$$P(\text{Lim guesses correctly}) = \frac{1}{5}$$

$$P(4 \text{ correct guess}) = {}^5C_4 \times \left(\frac{1}{5}\right)^4 \times \frac{4}{5} = \frac{4}{625}$$

(b)

$$P(1st \text{ wrong answer}) = \frac{4}{5} \times \frac{1}{4} \times \frac{1}{3} \times \frac{1}{2} = \frac{1}{30}$$

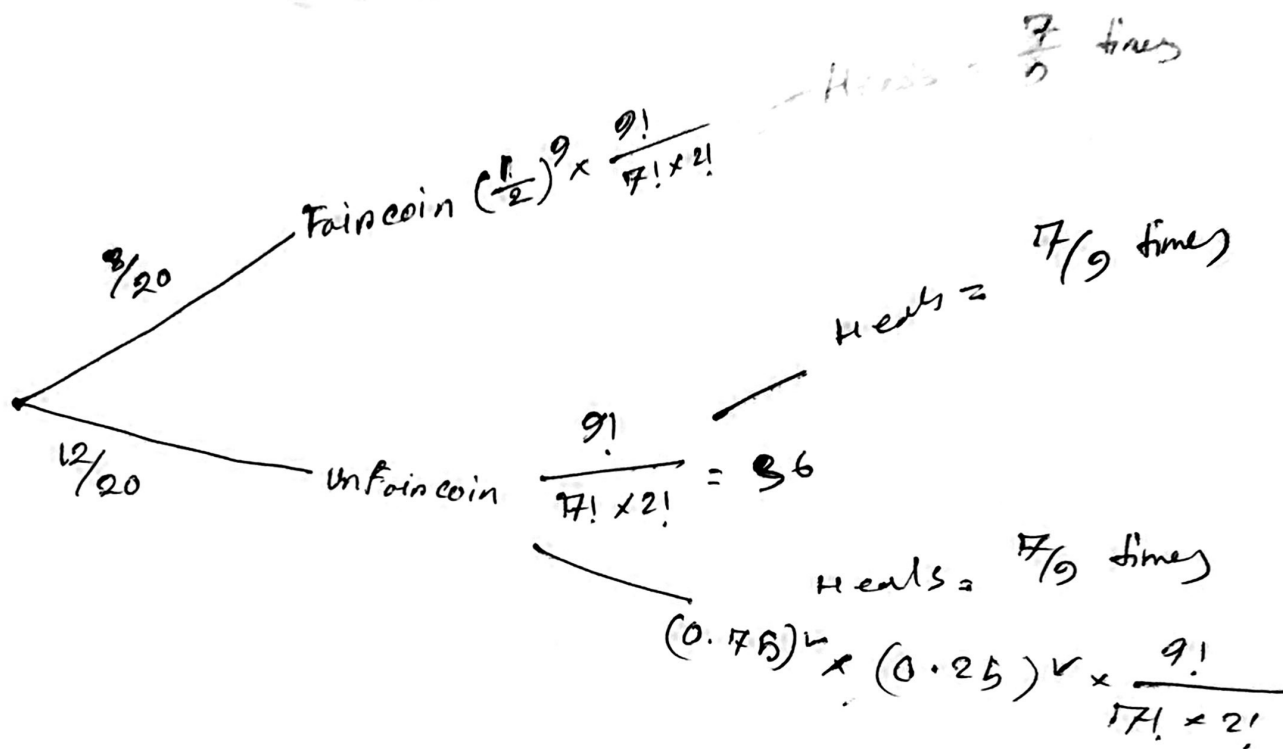
$$P(2nd \text{ answer is incorrect}) = \frac{1}{5} \times \frac{3}{4} \times \frac{1}{3} \times \frac{1}{2} = \frac{1}{40}$$

$$P(3rd \text{ " " "}) = \frac{1}{5} \times \frac{2}{4} \times \frac{1}{3} \times \frac{1}{2} = \frac{1}{60}$$

$$P(4th \text{ " " " "}) = \frac{1}{5} \times \frac{1}{4} \times \frac{1}{3} \times \frac{1}{2} = \frac{1}{120}$$

$$\therefore P = \frac{1}{30} + \frac{1}{40} + \frac{1}{60} + \frac{1}{120} = \frac{1}{12} \quad (\text{Ans})$$

Answers to the question no 6



U = un-fair coin

H = Heads 7/9 times

$$P(U/H) = \frac{\frac{12}{20} \times (0.75)^7 \times (0.25)^2 \times \frac{9!}{7! \times 2!}}{\left(\frac{8}{20} \times \left(\frac{1}{2}\right)^9 \times \frac{9!}{7! \times 2!}\right) + \left(\frac{12}{20} \times 0.25^2 \times 0.75^7 \times 36\right)}$$

$$= \frac{656}{17585} \quad \text{Ans}$$