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The Question Bank

Probability Questions for SBI PO Pre, IBPS PO Pre, SBI Clerk Mains, IBPS Clerk Mains & LIC AAO Exams.

Probability Quiz 4

Direction: Read the following questions carefully and choose the right answer.

1. The names of 5 students from section A, 6 students from section B and 7 students from section C were selected. The age of all the 18 students was different. Again, one name was selected from them and it was found that it was of section B. What was the probability that it was the youngest student of the section B?

A. $\frac{1}{18}$ B. $\frac{1}{15}$ C. $\frac{1}{6}$ D. $\frac{1}{12}$ E. None of these

2. A bag contains 35 balls of three different colors viz. red, orange and pink. The ratio of red balls to orange balls is 3 : 2, respectively and probability of choosing a pink ball is 3/7. If two balls are picked from the bag, then what is the probability that one ball is orange and one ball is pink?

A. $\frac{24}{119}$ B. $\frac{60}{119}$ C. $\frac{96}{595}$ D. $\frac{3}{17}$ E. None of these

3. There are total 18 balls in a bag. Out of them 6 are red in colour, 4 are green in colour and 8 are blue in colour. If Vishal picks three balls randomly from the bag, then what will be the probability that all the three balls are not of the same colour?

A. $\frac{95}{102}$ B. $\frac{19}{23}$ C. $\frac{21}{26}$ D. $\frac{46}{51}$ E. $\frac{9}{11}$

4. Ram and Shyam are playing chess together. Ram knows the two rows in which he has to put all the pieces in but he doesn't know how to place them. What is the probability that he puts all the pieces in the right place?

A. $\frac{8!}{16!}$ B. $\frac{8!}{(2x15!)}$ C. $\frac{8!}{15!}$ D. $\frac{(2\ x\ 8!)}{16!}$ E. None of these

5. A child paints the six faces of a cube with six different colors red, blue, pink, yellow, green and orange. What is the probability that red, pink and blue faces share a common corner?

A. $\frac{1}{6}$ B. $\frac{1}{20}$ C. $\frac{1}{10}$ D. $\frac{1}{5}$ E. None of these

6. **Three children took part in racing competition in their school with their respective probabilities to reach the finishing point being 1/3, 1/5 and 1/4 respectively. What is the probability that at least one of them will finish the race?**

A. $\frac{2}{5}$ B. $\frac{3}{5}$ C. $\frac{1}{5}$ D. $\frac{1}{4}$ E. $\frac{3}{4}$

7. **A tiffin box contains x pink and (x – 4) yellow toffees and another tiffin box contains (x – 1) yellow and (x – 3) pink toffees. If one of the tiffin box is selected at random and 2 toffees are drawn at random from the box thus selected, the probability that the two toffees are of different colours is 67/132. Find the total number of toffees in the first tiffin box?**

A. 8 B. 12 C. 10 D. 16 E. 14

8. **Aarti gave her project assignment to a shopkeeper for binding. There were 19 pages including a cover page, 12 pages of theory and 6 pages of drawings. She told the shopkeeper that the theory pages are in a particular order and the drawing pages can be arranged anywhere provided they are together. If the cover page is always kept first what is the probability that rest of the pages are arranged as per requirement?**

A. ${}^{12}C_1 \times 6!/18!$ B. ${}^{13}C_1 \times 6!/19!$ C. $13 \times 40/17!$ D. $13! \times 6!/18!$ E. None of these

9. **If the letters of the word "CRACKJACK" are rearranged in a random manner, what is the probability that vowels are neither together nor at the ends?**

A. $\frac{11}{18}$ B. $\frac{1}{2}$ C. $\frac{7}{36}$ D. $\frac{5}{12}$ E. None of these

10. **A basketball game is played between team Blue and Red. There are a total of 9 players in each team and 5 will play in the game. Ankit is in team blue and Vaibhav is in team Red. What is the probability that at least one of ankit or vaibhav is in playing five?**

A. $\frac{125}{153}$ B. $\frac{65}{81}$ C. $\frac{56}{81}$ D. $\frac{72}{81}$ E. None of these

CORRECT ANSWERS:

1	2	3	4	5	6	7	8	9	10
C	A	D	B	D	B	B	C	D	B

Explanations:

1. The total number of students = 18

When 1 name was selected from 18 names, the probability that he was of section B

$= \frac{6}{18} = \frac{1}{3}$

But from the question, there are 6 students from the section B and the age of all 6 are different therefore, the probability of selecting one i.e. youngest student from 6 students will be 1/6

Hence, option C is correct.

2. Let, the number of pink balls be p

Probability of choosing a pink ball = $\frac{p}{35}$

$\Rightarrow \frac{3}{7} = \frac{p}{35}$

$\Rightarrow p = 15$

So, remaining number of balls = (35 – 15) = 20

Number of orange balls = $\frac{2}{2+3} \times 20 = 2 \times 4 = 8$

Therefore, reqd. probability = $\frac{{}^{8}C_1 \times {}^{15}C_1}{{}^{35}C_2}$

$= \frac{8 \times 15}{35 \times 34/2} = \frac{24}{119}$

Hence, option A is correct.

3. Number of ways in which the person can pick three balls out of 18 balls = ${}^{18}C_3 = 816$

Number of ways of picking 3 balls of same colour = ${}^{6}C_3 + {}^{4}C + {}^{8}C_3 = (20 + 4 + 56) = 80$

Probability of picking three balls of same color = $\frac{80}{816} = \frac{5}{51}$

Required probability = 1 – probability of picking three balls of same colour = $1 - \frac{5}{51} = \frac{46}{51}$

Hence, option D is correct.

4. Total boxes = 16

Total pieces = 16

Similar pieces = 8 pawns, 2 bishops, 2 rooks, 2 knights

Total ways of arranging these 16 pieces in 16 boxes

$$= \frac{16!}{(8!\,2!\,2!\,2!)} = \frac{16!}{(8 \times 8!)}$$

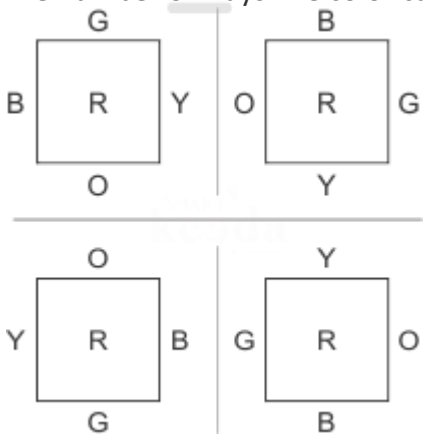
Ways of correct arrangement = 1

$$\text{Probability of correct arrangement} = \frac{1}{(16! / (8 \times 8!)}$$

$$= \frac{(8 \times 8!)}{16!} = \frac{8!}{(2 \times 15!)}$$

Hence, option B is correct..

5. We fix the red face and to its left pink face and bottom face as blue
The number of ways to arrange the other three colors = 3!
Total ways of painting the six colors
First we fix any one color on any one face, let's say red color.
The number of ways five color can be painted = 5!



Eliminating the repeated possibilities = $\frac{5!}{4} = 5 \times 3!$

We divide by four to eliminate the repeated possibilities as shown in the figure below. These possibilities are counted as different but don't give us a different arrangement. The arrangement in all four is same.

$$\text{Probability (Red, pink and blue share a common corner)} = \frac{3!}{5 \times 3!} = \frac{1}{5}$$

Hence, option D is correct.

6. Let the names of children be x, y and z. The probabilities of the three children to finish the race are 1/3, 1/5 and 1/4 respectively. It may be noted that one reaching the finishing point is independent of other reaching. If P(x), P(y) and P(z) denotes the probabilities.

The probability of at least one of them reaching the finishing point = 1 – P (none of them finishing the race)

$$= 1 - \left(\frac{2}{3}\right)\left(\frac{4}{5}\right)\left(\frac{3}{4}\right) = \frac{3}{5}$$

Hence, option B is correct.

7. Let the tiffin boxes be T1 and T2. T1 contains x pink and x-4 yellow toffees; T2 contains x-3 pink and x-1 yellow toffees. The possibility is that either of T1 or T2 is selected with a probability of 1/2 in each case. Having selected a tiffin, two different toffees are selected. The probability is 67/132.

$$\frac{[x(x-4)/{}^{2x-4}C_2]}{2} + \frac{[(x-1)(x-3)/{}^{2x-4}C_2]}{2} = \frac{67}{132}$$

$$\frac{\{(2x^2 - 8x + 3)/{}^{2x-4}C_2\}}{2} = \frac{67}{132}$$

$$\frac{(2x^2 - 8x + 3)}{{}^{2x-4}C_2} = \frac{134}{132}$$

$$\frac{(2x^2 - 8x + 3)}{{}^{2x-4}C_2} = \frac{67}{66} \quad \text{.....(i)}$$

Total number of toffees in first tiffin = x + x – 4 = 2x – 4
Now putting the value of total number of toffees i.e.; 2x – 4 in (1)using options
From option (a)
2x – 4 = 8
x = 6
put value of x in (1)

$$\text{L.H.S} = \frac{\{2(36) - 8(6) + 3\}}{{}^{8}C_2} = \frac{27}{28}$$

L.H.S ≠ R.H.S
From option (b)
2x – 4 = 12
x = 8

put value of x in (1)

$$\text{L.H.S} = \frac{67}{66}$$

L.H.S = R.H.S
Hence, option B is correct.

8. Pages = 1 cover page, 12 theory pages, 6 pictures page

Except cover page

Ways of arranging 12 + 6 pages = 18!

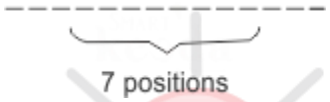
Ways of arranging so that the theory pages are in order and drawing pages come together= $^{13}C_1 \times 6!$

(As there are 13 gaps between 12 pages where 6 pages can be kept)

$$\text{Probability} = \frac{^{13}C_1 \times 6!}{18!} = \frac{13 \times 40}{17!}$$

Hence, option C is correct.

9. Total characters = 9, vowels = 2, consonants = 7



Except the end places, vowels can be arranged at 7 places
No of ways = $^7C_2 - 6$ (minus 6 for the chances when both vowels are together) = 15

$$\text{No of ways of arranging the 7 consonants} = \frac{7!}{3! \times 2!}$$

Letters are K – 3, A – 2, C – 2, R, and J

$$\text{No of arrangement with restriction} = \frac{15 \times !}{3! \times 2!}$$

$$\text{Total no of arrangements} = \frac{9!}{3! \times 2! \times 2!}$$

$$\text{Probability} = \frac{(15 \times 7!/\ 3! \times 2!)}{(9!/3! \times 2! \times 2!)} = \frac{5}{12}$$

Hence, option D is correct.

10. Total number of ways to select team blue without any restriction = ${}^{9}C_5$ Similarly team Red can be selected in ${}^{9}C_5$ ways

Total number of ways to select both the teams = ${}^{9}C_5 \times {}^{9}C_5$
P (at least one of them plays) = 1 – P (none of them plays)

Total number of ways of selecting team without selecting ankit and vaibhav = ${}^{8}C_5 \times {}^{8}C_5$

$$P \text{ (at least one of them plays)} = 1 - \frac{({}^{8}C_5 \times 8C_5)}{({}^{9}C_5 \times {}^{9}C_5)} = \frac{65}{81}$$

Hence, option B is correct.