Probability Questions for Bank Clerk Pre Exams.

Probability Quiz 3

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

1. A box contains 21 balls numbered 1 to 21. A ball is drawn and then another ball is drawn without replacement. What is the probability that both balls are even numbered?

A. $\frac{2}{7}$ B. $\frac{8}{21}$ C. $\frac{3}{14}$ D. $\frac{5}{21}$ E. None of these

2. There are 3 green, 4 orange and 5 white color bulbs in a bag. If a bulb is picked at random, what is the probability of having either a green or a white bulb?

A. $\frac{3}{4}$ B. $\frac{2}{3}$ C. $\frac{4}{3}$ D. $\frac{2}{5}$ E. None of these

3. A box contains slips with numbers from 1 to 50 written on them. A slip is drawn and replaced. Then another slip is drawn and after replacing another slip is drawn. What is the probability that an even number appears on the first draw, an odd number on the second draw and a number divisible by 3 on the third draw?

A. $\frac{1}{25}$ B. $\frac{2}{25}$ C. $\frac{8}{25}$ D. $\frac{4}{25}$ E. None of these

4. When 4 fair coins are tossed together what is the probability of getting at least 3 heads?

A. $\frac{1}{4}$ B. $\frac{3}{4}$ C. $\frac{5}{16}$ D. $\frac{3}{8}$ E. None of these

5. A committee of 3 members is to be made out of 6 men and 5 women. What is the probability that the committee has at least two women?

A. $\frac{10}{33}$ B. $\frac{14}{33}$ C. $\frac{14}{15}$ D. $\frac{13}{25}$ E. None of these

6. A box contains 5 pink, 3 green and 2 yellow balls. Three balls are picked up randomly. What is the probability that none of the ball drawn is green?

A. $\frac{3}{16}$ B. $\frac{7}{24}$ C. $\frac{5}{13}$ D. $\frac{4}{23}$ E. None of these

7. A box contains 4 tennis ball, 6 season and 8 dues balls. 3 balls are randomly drawn from the box. What is the probability that the balls are different?

A. $\frac{4}{17}$ B. $\frac{3}{11}$ C. $\frac{2}{13}$ D. $\frac{5}{17}$ E. None of these

8. 12 marbles are selected at random from a large collection of white, red, green and yellow marbles. The number of marbles of each colour is unlimited. Find the probability that the selection contains atleast one marble of each colour?

A. $\frac{34}{91}$ B. $\frac{33}{91}$ C. $\frac{36}{91}$ D. $\frac{23}{91}$ E. None of these

9. If in a round table conference n persons were asked to seated on a round table, then the probability that two named individuals will be neighbours :

A. 2 (n – 1) B. $\frac{2}{(n-1)}$ C. (n – 1) D. $\frac{1}{(n-1)}$ E. None of these

10. A bag contains 8 white balls, 13 black balls and 5 green balls. If two balls are drawn at random from the bag on after another, what is the probability that the first ball is white and the second ball is black?

A. $\frac{3}{26}$ B. $\frac{4}{25}$ C. $\frac{6}{25}$ D. $\frac{9}{25}$ E. None of these

Correct Answers:

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

Explanations:

1. There are 10 even numbers in the group 1-21.

$\therefore$ The probability that the first ball is even numbered = $\frac{10}{21}$

Since the ball is not replaced there are now 20 balls left, of which 9 are even numbered.

$\therefore$ The probability that the second ball is even numbered = $\frac{9}{20}$

$\therefore$ Required probability = $\frac{10}{21} \times \frac{9}{20} = \frac{9}{42} = \frac{3}{14}$

Hence, option C is correct.

---

2. Let E_1, E_2 be the event of picking a green bulb and white bulb respectively.
Total no. of bulbs in a bag = 3 + 4 + 5 = 12

$E_1 = \frac{3}{12} = \frac{1}{4}$

$E_2 = \frac{5}{12} = \frac{5}{12}$

$P(E_1 \text{ or } E_2) = P(E_1) + P(E_2)$

$= \frac{1}{4} + \frac{5}{12} = \frac{2}{3}$

Hence, option B is correct.

---

3. The probability of an even number appearing on the first draw is 1/2(since there are 25 even numbers in counting of 1 to 50).

The probability of an odd number appearing on the second draw is 1/2(since there are 25 odd numbers in counting of 1 to 50).

The probability of a number divisible by 3 appearing on the third draw is 16/50 (Since there are 16 numbers that are divisible by 3 while counting from 1 to 50.)

Since all these events have no relation with each other and no dependence either, and the slips are replaced, we can directly multiply the individual probabilities to get the resultant probability.
So, the probability of all the events taking place is

$\frac{1}{2} \times \frac{1}{2} \times \frac{16}{50} = \frac{2}{25}$

Hence, option B is correct.

4. When 4 fair coins are tossed simultaneously, the total number of outcomes is $2^4 = 16$

At least 3 heads implies that one can get either 3 heads or 4 heads.

One can get 3 heads in ${}^4C_3 = 4$ ways and can get 4 heads in ${}^4C_4 = 1$ ways.

$\therefore$ Total number of favourable outcomes = 4 + 1 = 5

$\therefore$ The required probability = $\frac{1}{4}$

Hence, option C is correct.

---

5. Number of possible combination of 3 persons in which 2 have to be women = (2 Women out of 5 x 1 Man out of 6) or (3 Women out of 5) = $({}^5C_2 \times {}^6C_1 + {}^5C_3)$

Total possible outcomes = ${}^{11}C_3$

$$= \frac{\frac{5!}{2! \times 3!} \times \frac{6!}{5! \times 1!} + \frac{5!}{3! \times 2!}}{\frac{11!}{3! \times 8!}} = \frac{70}{11 \times 15} = \frac{14}{33}$$

Hence, option B is correct.

---

6. Total no of balls = 5 + 3 + 2 = 10

$\therefore$ n(S) = No. of ways of drawing 3 balls out of 10 = ${}^{10}C_3$

Let E be the event of drawing 3 balls, none of which is green.

$\therefore$ n(E) = No. of ways of drawing 3 balls out of 7 balls = ${}^7C_3$

$\therefore$ $P(E) = \frac{n(E)}{n(S)} = \frac{{}^7C_3}{{}^{10}C_3}$

$$= \frac{\frac{7 \times 6 \times 5}{3 \times 2 \times 1}}{\frac{10 \times 9 \times 8}{3 \times 2 \times 1}} = \frac{7}{24}$$

Hence, option B is correct.

7.

Probability = $\frac{\text{Favourable outcomes}}{\text{Total outcomes}}$

Let us assume that all balls are unique.
There are a total of 18 balls.
Total ways = 3 balls can be chosen in $^{18}C_3$ ways

$= \frac{18!}{3! \times 15!} = \frac{18 \times 17 \times 16}{3 \times 2 \times 1} = 816$

Favourable ways = 1 tennis ball, 1 season ball, and 1 dues Ball = $4 \times 6 \times 8 = 192$

Probability = $\frac{192}{816} = \frac{4}{17}$
Hence correct option is (A)

---

8. Let W, R, G, Y represents no. of white, red, green and yellow coloured marbles contained in the selection of 12 marbles.
No. of ways of selecting 12 marbles is equal to the no. of non-negative integral solutions of
$W + R + G + Y = 12$
Total no. of ways = $C(12 + 4 - 1, 4 - 1) = C(15, 3)$
The no. of selections that contain at least one marble of each colour is equal to the number of positive integral solutions of $W + R + G + Y = 12$
$= C(12 - 1, 4 - 1) = C(11, 3)$

Required Probability = $\frac{C(11, 3)}{C(15, 3)} = \frac{33}{91}$
Hence, option B is correct.

---

9. Total number of ways in which n persons can sit on a round table is $(n - 1)!$
$\Rightarrow$ Total number of elementary events = $(n - 1)!$ Consider two named individuals as one person
Then there will be $(n - 1)$ persons who can sit on a round table in $(n - 2)!$ Ways
Also that two named individuals can be seated together in 2! Ways
Thus favourable number of elementary elements $= (n - 2)! \times 2!$ So , required probability

$= \frac{\text{favourable number of elementary elements}}{\text{total number of elementary events}}$

$= \frac{(n - 2)! \times 2!}{(n - 1)!}$

$= \frac{2}{n - 1}$
Hence, option B is correct.

10.

Probability that the first ball will be of white color = $\frac{8}{26} = \frac{4}{13}$

Probability that the second ball will be of black color = $\frac{13}{25}$

$\therefore$ Reqd. probability = $\frac{4}{13} \times \frac{13}{25} = \frac{4}{25}$

Hence, option B is correct.