

MULTIPLE CHOICE QUESTIONS ON BASIC PROBABILITY

Question 12

A box contains five red balls and three blue balls. John selects three balls from the box, without replacing them.

The probability that at least one of the balls that John selected is red is

- A. $\frac{5}{7}$
- B. $\frac{5}{14}$
- C. $\frac{7}{28}$
- D. $\frac{15}{56}$
- E. $\frac{55}{56}$

Question 15

A box contains six red marbles and four blue marbles. Two marbles are drawn from the box, without replacement.

The probability that they are the same colour is

- A. $\frac{1}{2}$
- B. $\frac{28}{45}$
- C. $\frac{7}{15}$
- D. $\frac{3}{5}$
- E. $\frac{1}{3}$

Question 11

A bag contains five red marbles and four blue marbles. Two marbles are drawn from the bag, without replacement, and the results are recorded.

The probability that the marbles are different colours is

- A. $\frac{20}{81}$
- B. $\frac{5}{18}$
- C. $\frac{4}{9}$
- D. $\frac{40}{81}$
- E. $\frac{5}{9}$

Question 10

For events A and B , $\Pr(A \cap B) = p$, $\Pr(A' \cap B) = p - \frac{1}{8}$ and $\Pr(A \cap B') = \frac{3p}{5}$.

If A and B are independent, then the value of p is

- A. 0
- B. $\frac{1}{4}$
- C. $\frac{3}{8}$
- D. $\frac{1}{2}$
- E. $\frac{3}{5}$

Question 13

A and B are events of a sample space S .

$$\Pr(A \cap B) = \frac{2}{5} \text{ and } \Pr(A \cap B') = \frac{3}{7}.$$

$\Pr(B'|A)$ is equal to

- A. $\frac{6}{35}$
- B. $\frac{15}{29}$
- C. $\frac{14}{35}$
- D. $\frac{29}{35}$
- E. $\frac{2}{3}$

Question 21

For two events, P and Q , $\Pr(P \cap Q) = \Pr(P' \cap Q)$.

P and Q will be independent events exactly when

- A. $\Pr(P') = \Pr(Q)$
- B. $\Pr(P \cap Q') = \Pr(P' \cap Q)$
- C. $\Pr(P \cap Q) = \Pr(P) + \Pr(Q)$
- D. $\Pr(P \cap Q') = \Pr(P \cap Q)$
- E. $\Pr(P) = \frac{1}{2}$

Question 14

A bag contains four white balls and six black balls. Three balls are drawn from the bag without replacement. The probability that they are all black is

- A. $\frac{1}{6}$
- B. $\frac{27}{125}$
- C. $\frac{24}{29}$
- D. $\frac{3}{500}$
- E. $\frac{8}{125}$

Question 21

Events A and B are mutually exclusive events of a sample space with

$$\Pr(A) = p \text{ and } \Pr(B) = q \text{ where } 0 < p < 1 \text{ and } 0 < q < 1.$$

$\Pr(A' \cap B')$ is equal to

- A. $(1 - p)(1 - q)$
- B. $1 - pq$
- C. $1 - (p + q)$
- D. $2 - p - q$
- E. $1 - (p + q - pq)$

Question 17

The sample space when a fair twelve-sided die is rolled is $\{1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12\}$. Each outcome is equally likely.

For which one of the following pairs of events are the events independent?

- A. $\{1, 3, 5, 7, 9, 11\}$ and $\{1, 4, 7, 10\}$
- B. $\{1, 3, 5, 7, 9, 11\}$ and $\{2, 4, 6, 8, 10, 12\}$
- C. $\{4, 8, 12\}$ and $\{6, 12\}$
- D. $\{6, 12\}$ and $\{1, 12\}$
- E. $\{2, 4, 6, 8, 10, 12\}$ and $\{1, 2, 3\}$

Question 15

The sample space when a fair die is rolled is $\{1, 2, 3, 4, 5, 6\}$, with each outcome being equally likely.

For which of the following pairs of events are the events independent?

- A. $\{1, 2, 3\}$ and $\{1, 2\}$
- B. $\{1, 2\}$ and $\{3, 4\}$
- C. $\{1, 3, 5\}$ and $\{1, 4, 6\}$
- D. $\{1, 2\}$ and $\{1, 3, 4, 6\}$
- E. $\{1, 2\}$ and $\{2, 4, 6\}$

Question 5

A bag contains three white balls and seven yellow balls. Three balls are drawn, one at a time, from the bag, without replacement.

The probability that they are all yellow is

- A. $\frac{3}{500}$
- B. $\frac{27}{1000}$
- C. $\frac{21}{100}$
- D. $\frac{7}{24}$
- E. $\frac{243}{1000}$