

PROBABILITY 5: QUIZ SOLUTIONS

All possible 3-digit numbers are to be made from the digits 5, 6, 7, 8, 9, used once only.

Question 1

What is the probability that the first digit will be a 9?

- A. $\frac{1}{3}$ B. $\frac{1}{4}$ C. $\frac{1}{5}$ D. $\frac{1}{6}$

Solution

1st digit is a 9, i.e., 9XX

$$P(\text{1st digit is a 9}) = \frac{1 \times 4 \times 3}{5 \times 4 \times 3} = \frac{1}{5}$$

So, the correct answer is C.

Question 2

What is the probability that a 7 will be followed by an 8?

- A. $\frac{1}{10}$ B. $\frac{1}{5}$ C. $\frac{1}{4}$ D. $\frac{1}{3}$

Solution

7 followed by 8, i.e., 78X or X78

$$P(\text{7 then 8}) = \frac{1 \times 1 \times 3}{5 \times 4 \times 3} + \frac{3 \times 1 \times 1}{5 \times 4 \times 3} = \frac{1}{10}$$

So, the correct answer is A.

Question 3

What is the probability that the first digit will be less than 8?

- A. $\frac{1}{10}$ B. $\frac{1}{5}$ C. $\frac{2}{5}$ D. $\frac{3}{5}$

Solution

1st digit < 8, i.e., 5XX or 6XX or 7XX

$$P(\text{1st digit} < 8) = \frac{3 \times 4 \times 3}{5 \times 4 \times 3} = \frac{3}{5}$$

So, the correct answer is D.

Question 4

What is the probability that all three digits will be odd numbers?

- A. $\frac{1}{10}$ B. $\frac{1}{5}$ C. $\frac{2}{5}$ D. $\frac{3}{5}$

Solution

All three odd, i.e., OOO

$$P(\text{all 3 odd}) = \frac{3 \times 2 \times 1}{5 \times 4 \times 3} = \frac{1}{10}$$

So, the correct answer is A.

Question 5

What is the probability that a 6 will be followed by an odd digit?

- A. $\frac{1}{10}$ B. $\frac{3}{10}$ C. $\frac{7}{10}$ D. $\frac{9}{10}$

Solution

6 followed by odd, i.e., 6OX or X6O

$$P(6 \text{ then odd}) = \frac{1 \times 3 \times 3}{5 \times 4 \times 3} + \frac{3 \times 1 \times 3}{5 \times 4 \times 3} = \frac{3}{10}$$

So, the correct answer is B.