Excel Coaching Classes

Date: 28-Jun-2026
Time: 60min

Probability

Marks: 20

Q.1(A) **Choose the correct alternative.** **(4)**

i **A two digit number is formed with digits 2, 3, 5, 7, 9 without repetition. What is the probability that the number formed is an even number?**

- (A) $\frac{1}{5}$
- (B) $\frac{4}{5}$
- (C) $\frac{3}{5}$
- (D) $\frac{2}{5}$

Ans: ["A"]

Explanation:

Sample space

S = {23, 25, 27, 29,

32, 35, 37, 39,

52, 53, 57, 59,

72, 73, 75, 79,

92, 93, 95, 97}

∴ n(S) = 20

Let X be the event that the number formed is an even number.

∴ X = {32, 52, 72, 92}

∴ n(X) = 4

∴ $P(X) = \frac{n(X)}{n(S)} = \frac{4}{20} = \frac{1}{5}$

ii **One coin and one die are thrown simultaneously. Let**

Condition for event X: To get head and an odd number.

Condition for event Y: To get a head or tail and an even number.

Condition for event Z: Number on the upper face is greater than 7 and tail on the coin.

Then n(Z) =

- (A) 10
- (B) 3
- (C) 7
- (D) 0

Ans: ["D"]

Explanation:

Condition for event Z: Number on the upper face is greater than 7 and tail on the coin.

The greatest number on the upper face of a die is 6.

∴ Event Z is an impossible event.

∴ Z = { }

∴ n(Z) = 0

iii **How many possibilities are there if any month of a year is selected randomly?**

- [x] (A) 12
- [ ] (B) 6
- [ ] (C) 1
- [ ] (D) 11

Ans: ["A"]

Explanation:

There are 12 months in a year.

∴ Required possibilities = 12

iv **A card is selected from a deck of 52 cards. The probability of it being a red face card is**

- [x] (A) $\frac{3}{26}$
- [ ] (B) $\frac{3}{13}$
- [ ] (C) $\frac{2}{13}$
- [ ] (D) $\frac{1}{2}$

Ans: ["A"]

Explanation:

Let S be the sample space.

∴ n(S) = 52

Let event X : Getting red face card.

∴ n(X) = 6

∴ Required probability = $\frac{n(X)}{n(S)} = \frac{3}{26}$

Q.1(B) Solve the following questions. (2)

i **For the following experiment write sample space 'S' and number of sample points n(S). Two digit numbers are formed from the digits 1, 3 and 7 where the digits are repeated.**

Ans: []

Explanation:

Two digit numbers formed from the digits 1, 3 and 7 where the digits are repeated.

∴ $S = \{11, 13, 17, 31, 33, 37, 71, 73, 77\}$

∴ $n(S) = 9$

ii **What is the probability of getting prime number from first 10 natural numbers?**

Ans: []

Explanation:

Sample space,

S = {1, 2, 3, 4, 5, 6, 7, 8, 9, 10}

∴ n(S) = 10

Let A be the event of getting prime number,

∴ A = {2, 3, 5, 7}

∴ n(A) = 4

∴ P(A) = $\frac{n(A)}{n(S)} = \frac{4}{10} = \frac{2}{5}$

∴ **The probability of getting prime number is** $\frac{2}{5}$.

Q.2 Solve the following questions.(Any two) **(4)**

i **A card is drawn at random from a well shuffled pack of 52 playing cards. Find the probability of the events that the card drawn is:**

i. a red card

ii. a face card

Ans: []

Explanation:

i. 'S' is the sample space. ∴ $n(S) = 52$

Event A : Card drawn is a red card.

Total red cards $= 13$ hearts +13 diamonds $= 26$

∴ $n(A) = 26$

∴ $P(A) = \frac{n(A)}{n(S)} = \frac{26}{52} = \frac{1}{2}$

∴ $\mathbf{P(A) = \frac{1}{2}}$

ii. Event B : Card drawn is a face card.

Total face cards = 12

∴ n(B) = 12

∴ $P(B) = \frac{n(B)}{n(S)} = \frac{12}{52} = \frac{3}{13}$

$\therefore$ $\mathbf{P(B) = \frac{3}{13}}$

ii **Each card bears one letter from the word 'mathematics'. The cards are placed on a table upside down. Find the probability that a card drawn bears the letter 'm'.**

Ans: []

Explanation:

Sample space

S = {m, a, t, h, e, m, a, t, i, c, s}

$\therefore$ n(S) = 11

Let A be the event that the card drawn bears the letter 'm'.

$\therefore$ A = {m, m}

$\therefore$ n(A) = 2

$\therefore$ $P(A) = \frac{n(A)}{n(S)}$

$\therefore$ $P(A) = \frac{2}{11}$

$\therefore$ **The probability that a card drawn bears letter 'm' is $\frac{2}{11}$.**

iii **Joseph kept 26 cards in a cap, bearing one English alphabet on each card. One card is drawn at random. What is the probability that the card drawn is a vowel card ?**

Ans: []

Explanation:

Each card bears an English alphabet.

$\therefore$ n(S) = 26

Let A be the event that the card drawn is a vowel card.

There are 5 vowels in English alphabets.

$\therefore$ A = {a, e, i, o, u}

$\therefore$ n(A) = 5

$\therefore$ $P(A) = \frac{n(A)}{n(S)} = \frac{5}{26}$

$\therefore$ **The probability that the card drawn is a vowel card is $\frac{5}{26}$.**

Q.3 Complete the following activity. (3)

i **A two digit number is to be formed from the digits 2, 3, 5 without repetition of the digits. Complete the following activity to find the probability that the number so**

formed is an odd number.

Activity:

Let S be the sample space.

∴ S = {23, 25, 32, ☐, 52, 53}

∴ n(S) = ☐

Event A: The number so formed is an odd number.

∴ A = {23, 25, ☐, 53}

∴ n(A) = 4

∴ P(A) = $\frac{\square}{n(S)}$ …[Formula]

∴ P(A) = $\frac{\square}{6}$

∴ P(A) = $\frac{\square}{3}$

Ans: []

Explanation:

Let S be the sample space.

∴ S = {23, 25, 32, 35 , 52, 53}

∴ n(S) = 6

Event A: The number so formed is an odd number.

∴ A = {23, 25, 35 , 53}

∴ n(A) = 4

∴ P(A) = $\frac{n(A)}{n(S)}$ …[Formula]

∴ P(A) = $\frac{4}{6}$

∴ P(A) = $\frac{2}{3}$

Q.4 Solve the following questions.(Any one) (3)

i **The faces of a die bear numbers 0, 1, 2, 3, 4, 5. If the die is rolled twice, then find the probability that the product of digits on the upper face is zero.**

Ans: []

Explanation:

Sample space,

S = {(0, 0), (0, 1), (0, 2), (0, 3), (0, 4), (0, 5),
(1, 0), (1, 1), (1, 2), (1, 3), (1, 4), (1, 5),
(2, 0), (2, 1), (2, 2), (2, 3), (2, 4), (2, 5),
(3, 0), (3, 1), (3, 2), (3, 3), (3, 4), (3, 5),
(4, 0), (4, 1), (4, 2), (4, 3), (4, 4), (4, 5),
(5, 0), (5, 1), (5, 2), (5, 3), (5, 4), (5, 5)}

∴ n(S) = 36

Let A be the event that the product of digits on the upper face is zero.

∴ A = {(0, 0), (0, 1), (0, 2), (0, 3), (0, 4), (0, 5), (1, 0), (2, 0), (3, 0), (4, 0), (5, 0)}

∴ n(A) = 11

∴ $P(A) = \frac{n(A)}{n(S)}$

∴ $P(A) = \frac{11}{36}$

∴ The probability that the product of the digits on the upper face is zero is $\frac{11}{36}$.

ii **Write sample space 'S' and the number of sample points n(S) for the following experiment. Also, write events A, B, C in the set form and write n(A), n(B), n(C).**

Three coins are tossed simultaneously.

Condition for event A: To get at least two heads.

Condition for event B: To get no head.

Condition for event C: To get head on the second coin.

Ans: []

Explanation:

Sample space,

S = {HHH, HHT, HTH, THH, HTT, THT, TTH, TTT}

∴ n(S) = 8

Condition for event A: To get at least two heads.

∴ A = {HHH, HTH, THH, HHT}

∴ n(A) = 4

Condition for event B: To get no head.

∴ B = {TTT}

∴ n(B) = 1

Condition for event C: To get head on the second coin.

∴ C = {HHH, HHT, THH, THT}

∴ n(C) = 4

Q.5 **Solve the following questions.(Any one)** **(4)**

i **Ravi throws two different dice together and finds the product of the two numbers obtained. Anita throws a die and cubes the number obtained. Who has the better chance to get the number 8?**

Ans: []
Explanation:
For Ravi:

Ravi throws two different dice together.

Sample space,

S = {(1, 1), (1, 2), (1, 3), (1, 4), (1, 5), (1, 6),
(2, 1), (2, 2), (2, 3), (2, 4), (2, 5), (2, 6),
(3, 1), (3, 2), (3, 3), (3, 4), (3, 5), (3, 6),
(4, 1), (4, 2), (4, 3), (4, 4), (4, 5), (4, 6),
(5, 1), (5, 2), (5, 3), (5, 4), (5, 5), (5, 6),
(6, 1), (6, 2), (6, 3), (6, 4), (6, 5), (6, 6)}

∴ n(S) = 36

Let A be the event that the product of the numbers obtained is 8.

∴ A = {(2, 4), (4, 2)}

∴ n(A) = 2

∴ P(A) = $\frac{n(A)}{n(S)} = \frac{2}{36} = \frac{1}{18}$

For Anita:

Anita throws a die.

Sample space,

S = {1, 2, 3, 4, 5, 6}

∴ n(S) = 6

Let B be the event that the cube of the number obtained is 8.

∴ B = {2}

∴ n(B) = 1

∴ P(B) = $\frac{n(B)}{n(S)} = \frac{1}{6}$

Since $\frac{1}{18} < \frac{1}{6}$,

Anita has the better chance to get the number 8.

ii **All the jacks, queens and kings are removed from a deck of 52 playing cards. The remaining cards are well shuffled and then one card is drawn at random. Giving ace a value 1 similar value for other cards, find the probability that the card has a value**

i. 7

ii. greater than 7

iii. less than 7

Ans: []

Explanation:

All the jacks, queens and kings are removed from a deck of 52 playing cards.

Cards remaining in the pack after removing 4 jacks, 4 queens and 4 kings = 52 – (4 + 4+ 4)

= 52 – 12

= 40

∴ n(S) = 40

i. Let A be the event that the card drawn has a value 7.

In a deck of cards, a card of value 7 can be a spade, a diamond, a club or a heart.

∴ n(A) = 4

P(A) = $\frac{n(A)}{n(S)} = \frac{4}{40}$

∴ P(A) = $\frac{1}{10}$

ii. Let B be the event that the card drawn has a value greater than 7.

In a deck of cards, a card of value 8, 9 and 10 can be a spade, a diamond, a club or a heart.

$\therefore$ n(B) = 12

$\therefore$ P (B) = $\frac{n(B)}{n(S)} = \frac{12}{40} = \frac{3}{10}$

iii. Let C be the event that the card drawn has a value less than 7.

In a deck of cards, a card of value 1, 2, 3, 4, 5 and 6 can be a spade, a diamond, a club or a heart.

$\therefore$ n (C) = 24

$\therefore$ P (C) = $\frac{n(C)}{n(S)} = \frac{24}{40} = \frac{3}{5}$

$\therefore$ **P(A) =** $\frac{1}{10}$**, P(B) =** $\frac{3}{10}$**, P(C) =** $\frac{3}{5}$