30- Practice Questions

[Probability]

1. There are 30 cars standing in a parking lot which consist of silver, grey and white cars. The number of grey and white cars are equal, and the number of silver cars is 3 more than the number of white cars. If 3 cars are randomly selected, what is the probability that at least one of them is silver?

1. 943/1123
2. 211/523
3. 1391/1595
4. 11/27
5. None of these

2. A contains X green Balls, '7 Red Balls, and 5 Yellow Balls. The probability to pick Green Ball at random is 3/5. Another Bag B contains '6 green Balls, 'x – 3' Yellow Balls and x - 4' Red Balls. If two balls are picked one after the other from Bag B at random then what is the probability for the Balls to be Red?

1. 18/125
2. 11/51
3. 6/35
4. 9/125
5. None of these

3. 12 Marbles and 12 balls are kept in a box. If 4 items are chosen at random, Find the probability that 2 is marble and another 2 is ball?

1. 13/36
2. 484/55
3. 63/136
4. 55/484
5. None of these

4. A person has two vessels (A & B) that contain white and blue balls. In the Vessel 'A' there are 8 white and 8 blue balls and, in the Vessel, 'B' there are 5 white and 6 blue balls. One ball is drawn out from any of these two vessels. What is the probability that the ball drawn is blue?

1. 25/28
2. 22/35
3. 15/28
4. 23/44
5. None of these

5. In an examination, there are three sections namely Reasoning, Math's, and English. Reasoning part contains 7 questions. There are 4 questions in math's section and 7 questions in English section. If three questions are selected randomly from the list of questions, then what is the probability that all of them are from reasoning?

1. 25/81
2. 33/911
3. 35/816
4. 4/13
5. None of these

6. Three cards are drawn one after another with replacements from a pack of cards. What is the probability of getting the first card a Jack, the second card a black card, and the third card an odd-numbered card?

1. 13/331
2. 41/337
3. 5/338
4. 14/331
5. None of these.

7. A box contains only three colors of balls- red, green, and blue. What is the minimum number of balls that should be picked from the box to ensure that at least 9 red balls or at least 10 green balls or at least 11 blue balls are picked?

1. 36
2. 44
3. 48
4. 28
5. 52

8. Atul and Bhuvan play a game where each is asked to select a number from 1 to 9. If the two numbers same, both win a prize. The probability that they will not win a prize in a single trial is:

1. 7/8
2. 6/7
3. 11/13
4. 8/9
5. None of these.

9. There are three boxes ‘A’, ‘B’ and ‘C’. Box ‘A’ contains 6 black and 12 white cubes, box ‘B’ contains 6black, and 8 white cubes and box ‘C’ contains 5 black and 9 white cubes. 1 of the boxes is selected at random and 1 cube is withdrawn from it. If the cube withdrawn is black, then find the probability that it is from box ‘B’.

1. 16/41
2. 18/41
3. 23/32
4. 14/41
5. None of these.

10. A box contains 12 yellow marbles, 'x' blue marbles and 12 white marbles. A box contains 5 yellow marbles, 2 blue marbles and 3 white marbles. The probability of drawing a blue marble at random from the box is 1/7. If (x/2) blue marbles from the box are transferred to the bag, then find the probability of drawing a blue marble and a white marble from the box.

1. 4/21
2. 7/31
3. 2/11
4. 9/25
5. None of these

11. A bag contains 4 white balls, 5pink balls and 3 black balls. 2 balls are drawn randomly. What is the probability that there are no black balls?

1. 5/23
2. 7/11
3. 17/23
4. 6/11
5. None of these

12.A jar contains 54 marbles each of which is blue green or white. The probability of selecting a blue marble at random from the jar is 1/3 and the probability of selecting a green marble at random is 4/9. How many white marbles does the jar contain.

1. 32
2. 46
3. 12
4. 38
5. None of these

13.A bag contains cards which are numbered from 2 to 90. A card is drawn at random from the bag. Find the probability that the card number is a perfect square.

1. 7/79
2. 8/89
3. 6/67
4. 11/79
5. None of these

14.Find the probability that a number selected at random from first hundred number is a multiple of 3 or 5?

1. 53/100
2. 24/97
3. 47/100
4. 49/100
5. None of these

15.A coin is tossed 9 times. Find the probability of almost 2 tails.

1. 23/256
2. 47/257
3. 41/256
4. 23/257
5. None of these

16.A word consists of 9 letters 5 consonants and 4 vowels. Three letters are chosen at random. What is the probability that more than one vowel will be selected.

1. 23/42
2. 37/42
3. 11/42
4. 13/47
5. None of these.

17.Two Dice are thrown simultaneously. Find the probability that the number on the first dice is more than the number of 2^{nd} Dice.

1. 5/12
2. 7/12
3. 4/13
4. 5/13
5. None of these

18.A brother and a sister appear for an interview against two vacant posts in an office. The probability of the brother's selection is 1/5 and that of the sister's selection is 1/3.What is the probability of only one of them is selected.

1. 2/5
2. 4/7
3. 7/11
4. 2/11
5. None of these.

19.A person can hit a target 3 times out of 8 shots. If he fires 10 shots, what is the probability that he will hit the target twice.

1. $(3^6 \times 5^9)/8^{12}$
2. $(3^4 \times 5^8)/8^{12}$
3. $(3^4 \times 5^{10})/8^{10}$
4. $(3^4 \times 5^9)/8^{10}$
5. None of these

20.Two friend Himanshu and Naman appeared in an exam. The probability that Himanshu will Qualify the exam is 1/20 and Naman will Qualify the exam is 1/10. The probability that both will qualify the exam is 1/50.Find the probability that only one of them qualify the exam.

1. 7/11
2. 13/100
3. 7/100
4. 11/100
5. None of these

21.In a cricket world cup the probability that India will win the cup is ¼. The Probability of Pakistan winning the cup is 1/5 and Australia winning the cup is 1/6.What is the probability that either of these 3 teams India, Pakistan and Australia would win the world cup?

1. 23/60
2. 37/60
3. 11/25
4. 13/60
5. None of these.

22.A speaks truth in 75% of cases And B is 80% of cases. What is the probability that they likely to contradict each other, narrating the same incident.

1. 11/20
2. 13/20
3. 7/20
4. 3/20
5. None of these.

23. A box contains 21 ribbons out of which [A] ribbons are white, and rest is green in colour. The probability of drawing a white ribbon and a green ribbon together is 18/35. Now, [B] green ribbons are added in the box such that the probability of drawing a green ribbon from the box is 1/2. Now, [C] yellow ribbons are added to the box such that the probability of drawing a yellow ribbon from the box is 1/5. Find the value of C-B?

1. 6
2. 9
3. 3
4. 15
5. 12

Direction-(24to25)

Harsh, Yash, and Jeet are three Friends. Harsh speaks truth 3 out of 4times, Yash speaks truth 4 out of 5 times while Jeet speaks truth 3 out of 5 times.

24.what is the probability that at least one of them narrates an incident truthfully.

1. 64/100
2. 11/20
3. 9/20
4. 49/50
5. None of these

25.What is the probability that at most two of them narrate an incident truthfully.

1. 12/25
2. 36/49
3. 16/25
4. 11/35
5. None of these

Direction (26 to 27)

Find the probability that when a hand of 3 card is drawn from a well shuffled deck. What is the probability that it has.

26.Probability of all face card –

1. 12/1115
2. 11/1105
3. 15/1120
4. 18/1122
5. None of these.

27.Probability of at least one king –

1. 1201/5525
2. 11/1105
3. 1331/1531
4. 13/24
5. None of these.

28.In a biased coin the probability of getting a head is 0.6, if we toss a coin 10times, what is the probability of getting exactly three heads?

1. $(2^4 \times 3^{10})/5^9$
2. $(3^4 \times 2^{10})/5^{10}$
3. $(3^{10} \times 2^4)/5^9$
4. $(3^4 \times 2^{10})/5^9$

5. None of these

29. A bag contains 30 white and some black balls. If the probability of drawing a black ball from the bag is 1.4 times that of drawing a white ball, find the number of black balls in the bag.

1. 30
2. 35
3. 42
4. 52
5. None of these

30. The names of 18 students from section A, 20 students from section B and 19 students from section C were selected. The age of all the 57 students was different. Again, one name was selected from them, and it was found that it was of section C. What was the probability that it was the youngest student of the section B?

1. 1/19
2. 1/3
3. 2/15
4. 3/19
5. None of these.

Solutions-

1. Ans-3

Let the number of grey and white cars be 'x' each. Then the number of silver cars will be 'x + 3'.

So, (x + 3) + x + x = 30

3x = 27

x = 9

So, number of silver, grey and white cars is 12, 9 and 9 respectively.

Required probability = P (at least one of them is silver) = 1 – P (none of them is silver)

= 1 – (18/30) × (17/29) × (16/28) = 1 – (204/1595) = (1391/1595)

2. ***Ans-3***

$x/(7+x+5) = 3/5$

$X = 18$

Now,

In Bag B: Red balls = 18 – 4 = 14

Yellow balls = 18 – 3 = 15

Green ball = 6

Required Probability = $14/35 \times 15/35 = 6/35$

3. ***Ans-4***

Total probability = ${}^{12}C_4 = 495$

Probability that 2 is marble and another 2 is ball = ${}^{12}C_2 \times {}^{12}C_2 = 4356$

probability = 495/4356 = 55/484

4. ***Ans-4***

Total balls in A vessel = 16, Total balls in b vessel = 11

A vessel = $1/2 \{({}^{8}C_1/{}^{16}C_1)\} = 1/4$

B vessel = $1/2 \{({}^{6}C_1/{}^{11}C_1)\} = 3/11$

Total Probability = 1/4 + 3/11 = 23/44

5. ***Ans-3***

Total no of questions= 18

number of reasoning questions=7

Probability = ${}^{7}C_3/{}^{18}C_3 = 35/816$

6. ***Ans-3***

In case of replacement-

probability of jack = 4/52

probability of black =26/52

p of odd numbers = 5×4=20/52

probability = 4/52) × (26/52) × (20/52)

=1/13 ×1/2 × 5/13

=5/338

7. ***Ans-4***

If we pick at least 8 red balls, 9 green balls and 10 blue balls from the box, the total number of balls picked from the box will be 27.

If one more ball is picked from the box, irrespective of what it is, it can be said that at least 9 red balls or at least 10 green balls or at least 11 blue balls have been picked from the basket.

Hence, required number of balls = 27 + 1 = 28

8. ***Ans-4***

Total number of ways in which both can select a number each:

= 9 × 9 = 81

Total number of ways in which both can select a same number so that they both can win:

= 9 ways

[They both can select {(1,1), (2,2), (3,3), (4,4), (5,5), (9,6), (7,7) (8,8) (9,9)}]

Probability that they win the prize:

= Favourable Cases/Total Cases = 9/81 = 1/9

Probability that they do not win a prize = 1 - 1/9 = 8/9.

9. ***Ans-2***

Since, there are three bags, therefore, probability of selecting any one of the boxes = (1/3)

i.e., P(A) = P(B) = P(C) = 1/3

Now,

Total cubes in box 'A' = 6 + 12 = 18

Number of black cubes in box 'A' = 6

Let 1 box has been chosen and 1 black cube is chosen from it, the required probability = (1/3) × (6/18) = (1/9)

Total cubes in box 'B' = 6 + 8 = 14

Number of black cubes in box 'B' = 6

Let 2 box has been chosen and 1 black cube is chosen from it, the required probability = (1/3) × (6/14) = (1/7)

Total cubes in box 'C' = 5 + 9 = 14

Number of black cubes in box 'C' = 5

Let 3 box has been chosen and 1 black cube is chosen from it, the required probability = (1/3) × (5/14) = (5/42)

Therefore, probability that box 'B' is chosen, and the cube chosen is black.

= {(1/7)} ÷ {(1/9) + (1/7) + (5/42)} = (1/7) ÷ (41/126) = 18/41

10. ***Ans-3***

According to the question,

x/ (12+ x + 12) = 1/7

=> 6x = 24

=> x = 4

Therefore, number of blue marbles transferred to bag = x/2 = 2

Total number of blue marbles in the box after the transfer = 2 + 2 = 4

Total number of marbles in the bag after the transfer = 5 + 2 + 3 + 2 = 12

Required probability = $({}^4C_1 \times {}^3C_1)/{}^{12}C_2 = 2/11$

11. ***Ans-4***

Required = ${}^9C_2 = 36$

total = ${}^{12}C_2 = 66$

probability = 36/66 = 6/11

12. ***Ans-3***

The probability of selecting a blue marble –

1/3 =Blue/54

Blue= 18

Now the probability of selecting a green marble –

4/9 =Green /54

Green = 24

Total number of white balls =54-(18+24)

=12

13. ***Ans-2***

Perfect square number between 2 and 90-

4,9,16,25,36,49,64,81

So now probability=8/89

14. ***Ans-3***

Multiple of 3 =99/3=33

Multiple of 5 = 100/5=20

Multiple of both 3 and 5 =90/15=6

So now total number of probable conditions = 33+20-6

=47

Probability = 47/100.

15. ***Ans-1***

Total cases = 2^9 =512

Probability of '0' tail =$^9C_0$ =1

1 tail = $^9C_1$=9

2 tails =$^9C_2$=36

Total number of favorable cases = 1+9+36 =46

Probability = 46/512

=23/256

16. ***Ans-2***

Probability that more than one vowel.

=1-P (no vowel)

=1- $^5C_3/^9C_3$

=1-(5×4×3)/9×8×7

=1-5/42

=37/42

17 ***Ans-1***

. When two Dice are thrown simultaneously then –

Total number of possible cases =6^2 =36

Number of favorable cases –

(2,1)

(3,1) (3,2)

(4,1) (4,2) (4,3)

(5,1) (5,2) (5,3) (5,4)

(6,1) (6,2) (6,3) (6,4) (6,5)

Total number of favorable cases = 15

Probability = 15/36 =5/12

18. ***Ans-1***

Probability of only one of them selected =

1/5×2/3 +4/5×1/3

=2/15 +4/15

=6/15 =2/5.

19. ***Ans-4***

$^{n}C_{r}\,(P)^{r}\,(1-P)^{n-r}$

number of total shots (n) = 10

r = 2

Probability of hit shots = 3/8

Probability of not hit = 5/8

probability that he will hit the target twice =

$^{10}C_{2}\,(3/8)^{2}\,(1-3/8)^{10-2}$

$= (10\times 9/2)\,(3/8)^{2}\,(5/8)^{8}$

$= (3^{4}\times 5^{9})/8^{10}$

20. ***Ans-4***

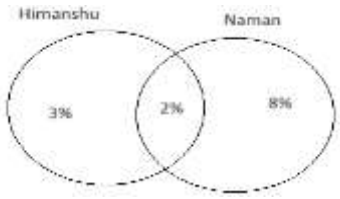
Probability of Himanshu =1/20 = 5%

Probability of Naman =1/10 =10%

Probability of both = 1/50 =2%

Probability that only one of them qualify the them= (8+3)/100

=11/100



21. ***Ans-2***

Note -Only one team can win the cup.

So now-

Probability = ¼+1/5+1/6 = (15+12+10)/60

=37/60

22. ***Ans-3***

Probability of A speaks truth =75% = ¾

And P (not speaks truth) =25% =1/4

Probability of B speaks truth = 80%=4/5

And P (not speaks truth) = 20% =1/5

Probability = (3/4×1/5) +(1/4×4/5)

=3/20 +4/20

=7/20

23. ***Ans-3***

Let number of white ribbons in the box is 'x'.

Number of green ribbons in the box = (21 – x)

According to question,

$[x \times (21 - x)]/ {}^{21}C2 = 18/35$

$x (21 - x)/210 = 18/35$

$x (21 - x) = 18 \times 6$

$x^2 - 21x + 108 = 0$

x = 12 or x = 9

So, the box contains either 12 white ribbons and 9 green ribbons or 9 white ribbons and 12 green ribbons.

Now, if 'B' green ribbons are added and probability of drawing a green ribbon from the box becomes 1/2, it means number of green ribbons was less than number of white ribbons in the box initially.

So, the numbers of white and green ribbons in the box initially were 12 and 9 respectively.

Therefore, [A] = 12 and [B] = 3.

Let number of yellow ribbons added in the box be 'z'.

So, [z/ (21 + 3 + z)] = 1/5

5z = z + 24

4z = 24

z = 6

So, [C] = 6

Required difference = 6-3 = 3

24 ***Ans-4***

Probability of speaks truth Harsh Yash and Jeet -

Harsh=3/4

Raj =4/5

Jeet =3/5

Total cases of speaks truth = (3,2,1,0)

Total cases of at least one speaks truth=1-P (not speaks truth)

=1-(1/4×1/5×2/5)

=98/100

=49/50

25. ***Ans-3***

Probability of speaks truth Harsh Yash and Jeet -

Harsh=3/4

Raj =4/5

Jeet =3/5

Probability of at most two of them = (1-(3/4×4/5×3/5)

=1-36/100

=64/100

=16/25

26 ***Ans-2***

Probability = $^{12}C_3/^{52}C_3$

= (12×11×10)/ (52×51×50)

=11/1105

27. ***Ans-1***

probability of at least one king = 1-P (no king)

=1- $^{48}C_3$ /$^{52}C_3$

=1- (48×47×46)/ (52×51×50)

=1-4324/5525

=1201/5525

28. ***Ans-4***

Probability of getting a head =0.6 =6/10=3/5

Probability of getting not head=1-3/5 =2/5

Direct shortcut-

$^{n}C_{r}(P)^{r}(1-P)^{n-r}$

Then now Probability=

$=^{10}C_{3}\ (3/5)^{3}(2/5)^{7}$

$= [(10\times9\times8)/3\times2] \times (3^{3}\times2^{7})/5^{10}$

$= (3^{4}\times2^{10})/5^{9}$

29. ***Ans-3***

Given,

Number of white balls = 30

Let x be the number of black balls.

Total number of balls in the bag = 30 + x

Also, the probability of drawing a black ball from the bag is 1.4 times that of drawing a white ball.

$\Rightarrow x/ (30 + x) = 1.4[30/ (30 + x)]$

$=5x = 7\times30$

$\Rightarrow x = 42$

Hence, the number of black balls in the bag = 42.

30. ***Ans-1***

The total number of students = 57

When 1 name was selected from 57 names, the probability that he was of section C = 19/57 = 1/3

But from the question, there are 19 students from the section C and the age of all 19 are different therefore, the probability of selecting one i.e. youngest student from 19 students will be 1/19.