



# PROBABILITY

## Q1.

A basket contains 6 red, 5 green and 8 blue balls. If four balls are picked at random, what is the probability that all four of them are either red or any two out of the four are green ?

- (a)  $5/1292$
- (b)  $925/3876$
- (c)  $359/1938$
- (d)  $11/3876$
- (e) None of these

## Q2.

Directions : Study the given information carefully to answer the questions that follow . A basket contains 6 blue, 2 red, 4 green and 3 yellow balls. If 2 balls are picked at random, what is the probability that either both are green or both are yellow?

- (a)  $2/5$
- (b)  $3/35$
- (c)  $1/3$
- (d)  $3/91$
- (e) None of these

## Q3.

If 5 balls are picked at random, what is the probability that at least one is blue ?

- (a)  $137/143$
- (b)  $9/91$
- (c)  $18/455$
- (d)  $2/5$
- (e) None of these

## Q4.

If 2 balls are picked at random, what is the probability that both are blue ?

- (a)  $1/5$
- (b)  $8/91$
- (c)  $2/15$
- (d)  $7/27$
- (e) None of these

## Q5.

If 4 balls are picked at random, what is the probability that 2 are red and 2 are green?

- (a)  $4/15$
- (b)  $5/27$
- (c)  $1/3$
- (d)  $2/455$
- (e) None of these

## Q6.

If 3 balls are picked at random, what is the probability that none is yellow?

- (a)  $3/455$
- (b)  $1/5$
- (c)  $44/91$
- (d)  $4/5$

(e) None of these

## Q7.

A basket contains three blue and four red balls. If three balls are drawn at random from the basket, what is the probability that till the three are either blue or red ?

- (a) 1
- (b)  $1/7$
- (c)  $3/14$
- (d)  $3/28$
- (e) None of these

## Q8.

Direction : Study the given information carefully to answer the questions that follow. An urn contains 4 green, 5 blue, 2 red and 3 yellow marbles. If two marbles are drawn, at random, what is the probability that both are red Or at least one is red ?

- (a)  $26/93$
- (b)  $2/7$
- (c)  $199/366$
- (d)  $135/193$
- (e) None of these

## Q9.

If three marbles are drawn at random, what is the probability that at least one is yellow?

- (a)  $1/5$
- (b)  $199/364$
- (c)  $125/364$
- (d)  $5/9$
- (e) None of these

## Q10.

If eight marbles are drawn at random, what is the probability that there are equal number of marbles of each colour?

- (a)  $3/8$
- (b)  $351/738$
- (c)  $60/1001$
- (d)  $1/1001$
- (e) None of these

## Q11.

If three marbles are drawn at random, what is the probability that none is green ?

- (a)  $3/8$
- (b)  $273/748$
- (c)  $30/91$
- (d)  $41/91$
- (e) None of these

## Q12.

If four marbles are drawn at random, what is the probability that two are blue and two are red ?

- (a)  $10/1001$
- (b)  $7/17$
- (c)  $15/384$



- (d)  $3/5$   
(e) None of these

**Q13.**

A bag contains 13 white and 7 black balls. Two balls are drawn at random. What is the probability that they are of the same colour?

- (a)  $41/190$   
(b)  $41/190$   
(c)  $59/190$   
(d)  $99/190$   
(e)  $77/190$

**Q14.**

From a well-shuffled pack of 52 playing cards, one card is drawn at random. What is the probability that the card drawn will be a black king ?

- (a)  $1/26$   
(b)  $7/13$   
(c)  $3/13$   
(d)  $9/13$   
(e)  $1/13$

**Q15.**

Directions : Read the following information to answer these questions. There are 9 red, 7 white and 4 black balls in an urn. Two balls are drawn at random from the urn. What will be the probability that both the balls are red ?

- (a)  $18/95$   
(b)  $9/95$   
(c)  $9/10$   
(d)  $8/95$   
(e)  $5/19$

**Q16.**

If two balls are selected at random what is the probability that one ball is white and the other ball is red ?

- (a)  $91/190$   
(b)  $63/190$   
(c)  $5/19$   
(d)  $4/95$   
(e)  $71/190$

**Q17.**

A bag contains 3 red balls, 5 yellow balls and 7 pink balls. If one ball is drawn at random from the bag, what is the probability that it is either pink or red ?

- (a)  $1/3$   
(b)  $2/3$   
(c)  $1/4$   
(d)  $2/5$   
(e) None of these

**Q18.**

A bag contains 5 red balls, 7 yellow balls and 3 pink balls. If two balls are drawn at random from the bag,

one after another, what is the probability that the first ball is red and the second ball is yellow?

- (a)  $5/12$   
(b)  $3/8$   
(c)  $1/4$   
(d)  $1/8$   
(e)  $1/6$

**Q19.**

There are 6 red balls, 5 yellow and 3 pink balls in an urn. Two balls are drawn at random. What is the probability that none of the drawn balls is of red colour ?

- (a)  $8/13$   
(b)  $7/13$   
(c)  $6/13$   
(d)  $5/13$   
(e)  $4/13$

**Q20.**

A bag contains 4 red, 5 yellow and 6 pink balls. Two balls are drawn at random. What is the probability that none of the balls drawn are yellow in colour?

- (a)  $1/7$   
(b)  $3/7$   
(c)  $2/7$   
(d)  $5/14$   
(e)  $9/14$

**Q21.**

A bag contains 6 black and 8 white balls. One ball is drawn at random. What is the probability that the ball drawn is white?

- (a)  $3/4$   
(b)  $4/7$   
(c)  $1/8$   
(d)  $3/7$   
(e)  $1/4$

**Q22.**

What is the probability that a number selected from numbers 1, 2, 3, 30, is prime number, when each of the given numbers is equally likely to be selected?

- (a)  $9/30$   
(b)  $8/30$   
(c)  $10/30$   
(d)  $11/30$   
(e)  $21/30$

**Q23.**

An urn contains 9 red, 7 white and 4 black balls. If two balls are drawn at random then find the probability that both the balls are random ?

- (a)  $17/95$   
(b)  $18/95$   
(c)  $1/12$   
(d)  $91/190$   
(e) None of these

**Q24.**

Out of 5 girls and 3 boys, 4 children are to be randomly selected for a quiz contest. What is the probability that all are girls ?

- (a)  $1/14$
- (b)  $1/7$
- (c)  $5/17$
- (d)  $2/17$
- (e) None of these

**Q25.**

Directions : Study the given information carefully and answer the questions that follow: A basket contains 4 red, 5 blue and 3 green marbles. If three marbles are picked at random, what is the probability that either all are green or all are red ?

- (a)  $7/44$
- (b)  $7/12$
- (c)  $5/12$
- (d)  $1/44$
- (e) None of these

**Q26.**

If two marbles are picked at random, what is the probability that both are red ?

- (a)  $3/7$
- (b)  $1/2$
- (c)  $2/11$
- (d)  $1/6$
- (e) None of these

**Q27.**

If three marbles are picked at random, what is the probability that at least one is blue ?

- (a)  $7/12$
- (b)  $37/44$
- (c)  $5/12$
- (d)  $7/44$
- (e) None of these

**Q28.**

Directions : Study the given Information carefully and answer the questions that follow: An urn contains 6 red, 4 blue, 2 green and 3 yellow marbles. If four marbles are picked at random, what is the probability that at least one is blue

- (a)  $4/15$
- (b)  $69/91$
- (c)  $11/15$
- (d)  $22/91$
- (e) None of these

**Q29.**

If two marbles are picked at random, what is the probability that both are red ?

- (a)  $1/6$
- (b)  $1/3$
- (c)  $2/15$

(d)  $2/5$

(e) None of these

**Q30.**

If three marbles are picked at random, what is the probability that two are blue and one is yellow?

- (a)  $3/91$
- (b)  $1/5$
- (c)  $18/455$
- (d)  $7/15$
- (e) None of these

**Q31.**

If four marbles are picked at random, what is the probability that one is green, two are blue and one is red ?

- (a)  $24/455$
- (b)  $13/35$
- (c)  $11/15$
- (d)  $1/3$
- (e) None of these

**Q32.**

If two marbles are picked at random, what is the probability that either both are green or both are yellow ?

- (a)  $5/91$
- (b)  $1/35$
- (c)  $1/3$
- (d)  $4/105$
- (e) none of these

**Q33.**

A bag contains 9 white and 5 blackballs. Two balls are drawn at random. What is the probability that they are of the same colour ?

- (a)  $47/91$
- (b)  $46/91$
- (c)  $45/91$
- (d)  $2/3$
- (e) None of these

**Q34.**

A dice is thrown twice. What is the probability of getting a sum 9 from both the throws ?

- (a)  $1/9$
- (b)  $2/9$
- (c)  $1/3$
- (d)  $3/4$
- (e) None of these

**Q35.**

Three balls are drawn at random from the bag What is the probability that 2 balls will be red and 1 ball will be green?

- (a)  $5/68$
- (b)  $3/68$
- (c)  $7/68$
- (d)  $9/68$



(e) None of these

**Q36.**

What is the probability of drawing one ball that will be neither red nor green ?

(a)  $1/3$

(b)  $4/9$

(c)  $5/9$

(d)  $2/3$

(e) None of these

**Q37.**

What is the probability of drawing two balls of same colour ?

(a)  $13/153$

(b)  $48/153$

(c)  $49/153$

(d)  $46/153$

(e) None of these

**Q38.**

Directions : Study the information carefully to answer these questions. A bag contains 7 blue balls and 5 yellow balls. If two balls are selected at random, what is the probability that none is yellow ?

(a)  $5/33$

(b)  $5/22$

(c)  $7/22$

(d)  $7/33$

(e)  $7/66$

**Q39.**

A die is thrown twice. What is the probability of getting a sum 7 from both the throws ?

(a)  $5/18$

(b)  $1/18$

(c)  $1/9$

(d)  $1/6$

(e) none of these

**Q40.**

What is the difference between the number of females who are non-graduates and the number of males who are graduates ?

(a) 2

(b) 24

(c) 4

(d) 116

(e) 36

**Q41.**

What is the sum of the number of females who are graduates and the number of males who are non-graduates ?

(a) 184

(b) 96

(c) 156

(d) 84

(e) 196

**Q42.**

What is the ratio between the total number of males and the number of females who are non-graduates ?

(a) 6:1

(b) 8 :1

(c) 8 : 3

(d) 5 :2

(e) 7:2

**Q43.**

Directions : Study the information carefully to answer these questions. In a bag there are 6 red balls. 4 green balls and 8 yellow balls. Three balls are drawn at random from the bag. What is the probability that 2 balls will be red and 1 ball will be green?

(a)  $5/68$

(b)  $3/68$

(c)  $7/68$

(d)  $9/68$

(e) None of these

**Q44.**

What is the probability of drawing one ball that will be neither red nor green ?

(a)  $1/3$

(b)  $4/9$

(c)  $5/9$

(d)  $2/3$

(e) none of these

**Q45.**

What is the probability of drawing two balls at the same time ?

(a)  $53/153$

(b)  $48/153$

(c)  $49/153$

(d)  $46/153$

(e) none of these

**Q46.**

Directions : Study the information carefully to answer these questions. A bag contains four blue shirts, five red shirts and six yellow shirts. Three shirts are drawn randomly. What is the probability that exactly one of them is blue ?

(a)  $36/91$

(b)  $40/91$

(c)  $44/91$

(d)  $48/91$

(e)  $31/91$

**Q47.**

One shirt is drawn randomly. What is the probability that it is either red or yellow ?

(a)  $4/15$

(b)  $7/15$

(c)  $11/15$

(d)  $8/15$



(e)  $13/15$

**Q48.**

Two shirts are drawn randomly. What is the probability that both of them are blue ?

(a)  $3/35$

(b)  $1/35$

(c)  $2/35$

(d)  $4/35$

(e)  $6/35$

**Q49.**

In a bag there are 4 white, 4 red and 2 green balls. Two balls are drawn at random. What is the probability that at least one ball is of green colour ?

(a)  $5/7$

(b)  $10/21$

(c)  $2/7$

(d)  $11/21$

(e) None of these

**Q50.**

A bag contains 5 red balls, 6 yellow and 3 green balls. If two balls are picked at random, what is the probability that both are red or both are green in colour ?

(a)  $2/15$

(b)  $1/15$

(c)  $2/7$

(d) 1

(e) none of these

**Q51.**

A bag contains 4 red balls, 6 green balls and 5 blue balls. If three balls are picked at random, what is the probability that two of them are green and one of them is blue in colour ?

(a)  $20/21$

(b)  $10/91$

(c)  $15/91$

(d)  $5/91$

(e)  $25/91$

**Q52.**

Directions : Study the information carefully to answer these questions. A bag contains 2 red, 3 green and 2 blue balls. 2 balls are to be drawn randomly. What is the probability that the balls drawn contain no blue ball ?

(a)  $5/7$

(b)  $10/21$

(c)  $2/7$

(d)  $11/21$

(e) none of these

**Q53.**

If two marbles are picked at random, what is the probability that both are green ?

(a)  $2/15$

(b)  $1/15$

(c)  $2/7$

(d) 1

(e) None of these

**Q54.**

If three marbles are picked at random, what is the probability that two are blue and one is yellow ?

(a)  $2/15$

(b)  $6/91$

(c)  $12/91$

(d)  $3/15$

(e) None of these

**Q55.**

If four marbles are picked at random, what is the probability that at least one is yellow ?

(a)  $91/123$

(b)  $69/91$

(c)  $125/143$

(d)  $1/4$

(e) None of these

**Q56.**

If two marbles are picked at random, what is the probability that either both are red or both are green ?

(a)  $3/5$

(b)  $4/105$

(c)  $2/7$

(d)  $5/91$

(e) None of these

**Q57.**

If four marbles are picked at random, what is the probability that one is green, two are blue and one is red ?

(a)  $4/15$

(b)  $17/280$

(c)  $6/91$

(d)  $11/15$

(e) None of these

**Q58.**

There are 8 brown balls, 4 orange balls and 5 blackballs in a bag. Five balls are chosen at random, What is the probability of their being 2 brown balls, 1 orange ball and 2 black balls ?

(a)  $191/1547$

(b)  $180/1547$

(c)  $280/1547$

(d)  $189/1547$

(e) NONE OF THESE

**Q59.**

A bag A contains 4 green and 6 red balls. Another bag B contains 3 green and 4 red balls. If one ball is drawn from each bag, find the probability that both are green

(a)  $13/70$



- (b)  $1/4$
- (c)  $6/35$
- (d)  $8/35$
- (e) None of these

**Q60.**

A box contains 14 eggs out of which 8 are rotten. Two eggs are chosen at random. What is the probability that none of the chosen eggs is rotten ?

- (a)  $5/23$
- (b)  $10/23$
- (c)  $12/91$
- (d)  $15/91$
- (e)  $8/91$

**Q61.**

A bag A contains 4 green and 6 red balls. Another bag B contains 3 green and 4 red balls. If one ball is drawn from each bag, find the probability that both are green.

- (a)  $13/70$
- (b)  $1/4$
- (c)  $6/35$
- (d)  $8/35$
- (e) NONE OF THESE

**Q62.**

A bag contains 13 white and 7 black balls. Two balls are drawn at random, What is the probability that they are of the same colour ?

- (a)  $41/190$
- (b)  $21/190$
- (c)  $59/190$
- (d)  $99/190$
- (e)  $77/190$

**Q63.**

A box contains 4 black balls, 3 red balls and 5 green balls 2 balls are drawn from the box at random. What is the probability that both the balls are of the same colour ?

- (a)  $47/68$
- (b)  $1/6$
- (c)  $19/66$
- (d)  $2/11$
- (e) None of these

**Q64.**

Three balls are drawn from the urn. What is the probability that two balls are red and 1 ball is blue ?

- (a)  $11/408$
- (b)  $37/408$
- (c)  $35/408$
- (d)  $1/102$
- (e) None of these

**Q65.**

An urn contains 3 red and 4 green marbles. If three marbles are picked at random, what is the probability that two are green and one is red ?

- (a)  $3/7$
- (b)  $18/35$
- (c)  $5/14$
- (d)  $4/21$
- (e) None of these

**Q66.**

A property tax increase was proposed by a municipal corporation and it was observed that 40% of the property owners favored it while 80% of the non-owners of property favored it. If 70% of voters are property owners, what is the probability that a voter selected at random would be the one favoring the increase?

- (a) 0.8
- (b) 0.52
- (c) 0.4
- (d) Data Inadequate
- (e) None of these

**Q67.**

In a container there are 28 eggs out of which 8 eggs are rotten. If two eggs are chosen at random, what will be the probability that at least one egg is rotten ?

- (a)  $94/189$
- (b)  $95/187$
- (c)  $93/189$
- (d)  $97/189$
- (e) None of these

**Q68.**

The circle given below is divided into eight sectors of equal area. What is the probability that the spinner will land on an even-numbered region in each of two consecutive spins?

- (a)  $25/10$
- (b)  $3/8$
- (c)  $1/4$
- (d)  $9/64$
- (e)

**Q69.**

A class of 30 students occupy a classroom containing 5 rows of seats, with 8 seats in each row. If the students seat themselves at random, the probability that the sixth seat in the fifth row will be empty is :

- (a)  $1/5$
- (b)  $1/3$
- (c)  $1/4$
- (d)  $2/5$
- (e)

**Q70.**

Directions : Read the following information to answer the questions given below it. An urn contains 5 red



balls, 6 green balls and 7 blue balls. Two balls are drawn at random from the urn. What is the probability that both the balls are of red colour ?

- (a) 10/153  
 (b) 10/53  
 (c) 3/31  
 (d) 2/31  
 (e) None of these

**Q71.**

Directions : Read the following information to answer the questions given below it. An urn contains 5 red balls, 6 green balls and 7 blue balls. Two balls are drawn at random from the urn. Two balls are drawn at random from the urn. What is the probability that both the balls are of green colour ?

- (a) 1/17  
 (b) 5/51  
 (c) 2/17  
 (d) 7/51  
 (e) 6/51

**Q72.**

There are 4 red balls, 4 green balls and 6 blue balls in a box. If two balls are drawn randomly, what is the probability that at least one of them is blue ?

- (a) 6/13  
 (b) 7/13  
 (c) 8/13  
 (d) 10/13  
 (e) 9/13

**Q73.**

If one ball is drawn randomly, what is the probability that it is either red or blue ?

- (a) 5/9  
 (b) 7/9  
 (c) 4/7  
 (d) 3/7  
 (e) 5/7

**Q74.**

If three balls are drawn randomly, what is the probability that one of them is green and the other two are blue?

- (a)(1) 15/91  
 (b)(2) 24/91  
 (c)(3) 20/91  
 (d)(4) 10/91  
 (e)(5) 12/91

**Q75.**

There are 6 red balls and 4 yellow balls in a bag. Two balls are simultaneously drawn at random. What is the probability that both the balls are of same colour ?

- (a) 7/15  
 (b) 5/12  
 (c) 7/11

(d) 7/8

(e) 1/8

**Q76.**

There are 7 red balls and 8 yellow balls in a bag. Two balls are simultaneously drawn at random. What is the probability that both the balls are of same colour ?

- (a) 3/18  
 (b) 13/30  
 (c) 3/10  
 (d) 7/18  
 (e) 7/15

**ANSWERS :**

1 b	2 b	3 a	4 e	5 d	6 c
7 b	8 e	9 b	10 c	11 c	12 a
13 d	14 a	15 a	16 b	17 b	18 e
19 e	20 b	21 b	22 c	23 b	24 a
25 d	26 e	27 b	28 b	29 e	30 c
31 a	32 d	33 b	34 a	35 a	36 b
37 c	38 c	39 d	40 c	41 e	42 b
43 a	44 b	45 c	46 c	47 c	48 c
49 d	50 c	51 c	52 b	53 e	54 c
55 b	56 b	57 c	58 c	59 c	60 d
61 c	62 d	63 c	64 c	65 b	66
67 a	68 b	69 a	70 a	71 b	72 e
73 e	74 d	75 a	76 e		

1.(2) Number of balls = 5 + 5 + 8 = 19

Exhaustive number of cases = Ways of selecting 4 balls out of 19

$$= {}^{19}C_4 = (19 \times 18 \times 17 \times 16) / (1 \times 2 \times 3 \times 4) = 3876$$

Favourable number of cases = Selecting 4 red balls or any two green balls out of the four

$$= {}^6C_4 + {}^5C_2 \times {}^{14}C_2$$

$$= (6 \times 5 \times 4 \times 3) / (1 \times 2 \times 3 \times 4) + (5 \times 4) / 2 \times (14 \times 13) / 2$$

$$= 15 + 910 = 925$$

$$\therefore \text{Required probability} = 925 / 3876$$

2.(2) Total number of balls in the basket = 15

Exhaustive number of cases = Number of ways of selecting 2 balls out of 15 balls =  ${}^{15}C_2$

$$= (15 \times 14) / (1 \times 2) = 105$$

Favourable number of cases

$$= {}^4C_2 + {}^3C_2$$

$$= (4 \times 3) / (1 \times 2) + (3 \times 2) / (1 \times 2) = 6 + 3 = 9$$

$$\therefore \text{Required probability} = 9 / 105 = 3 / 35$$

3.(1) Exhaustive number of cases = Number of ways of selecting 5

balls out of 15 balls =  ${}^{15}C_5$

Let no blue ball be selected.

$\therefore$  Number of ways of selecting 5 balls out of 9 balls with blue balls =  ${}^9C_5$

$$\text{Required probability} = 1 - {}^9C_5 / {}^{15}C_5$$

$$= 1 - (9 \times 8 \times 7 \times 6 \times 5) / (15 \times 14 \times 13 \times 12 \times 11)$$

$$= 1 - 6 / 143 = 137 / 143$$

4.(5) Exhaustive number of cases

$$= {}^{15}C_2 = (15 \times 14) / (1 \times 2)$$

$$= 105$$

Favourable number of cases





$$= {}^6C_2 = (6 \times 5)/(1 \times 2) = 15$$

$$\therefore \text{Required probability} = 15/105 = 1/7$$

**5.(4)** Exhaustive number of cases

$$= {}^{15}C_4 = (15 \times 14 \times 13 \times 12)/(1 \times 2 \times 3 \times 4) = 1365$$

Favourable number of cases

$$= {}^2C_2 \times {}^4C_2 = 1 \times (4 \times 3)/(1 \times 2) = 6$$

$$\therefore \text{Required probability} = 6/1365 = 2/455$$

**6.(3)** Exhaustive number of cases

$$= {}^{15}C_3 = (15 \times 14 \times 13)/(1 \times 2 \times 3) = 455$$

Favourable number of cases

$$= {}^{12}C_3 = (12 \times 11 \times 10)/(1 \times 2 \times 3) = 220$$

$$\therefore \text{Required probability}$$

$$= 220/455 = 44/91$$

**7.(2)** Number of possible outcomes =  $n(S) = {}^7C_3 = (7 \times 6 \times 5)/(1 \times 2 \times 3)$

Favourable number of cases

$$= n(E) = {}^3C_3 + {}^4C_3 = 1 + 4 = 5$$

$$\therefore \text{Required probability} = n(E)/n(S)$$

$$= 5/35 = 1/7$$

**8.(5)** Total number of marbles in the urn

$$= 4 + 5 + 2 + 3 = 14$$

Total possible outcomes = selection of 2 marbles out of 14 marbles

$$= {}^{14}C_2 = (14 \times 13)/(1 \times 2) = 91$$

Favourable number of cases

$$= {}^2C_2 + {}^2C_1 \times {}^{12}C_1$$

$$= 1 + 2 \times 12 = 25$$

$$\therefore \text{Required probability} = 25/91$$

**9.(2)** Total possible outcomes =  ${}^{14}C_3$

$$= (14 \times 13 \times 12)/(1 \times 2 \times 3) = 364$$

When no marble is yellow,

Favourable number of cases

$$= {}^{11}C_3 = (11 \times 10 \times 9)/(1 \times 2 \times 3) = 165$$

$$\therefore \text{Probability that no marble is yellow} = 165/364$$

$$\therefore \text{Required probability}$$

$$= 1 - 165/364 = (364 - 165)/364 = 199/364$$

**10.(3)** Total possible outcomes

$$= {}^{14}C_8 = {}^{14}C_6 \quad [{}^nC_r = {}^nC_{n-r}]$$

$$= (14 \times 13 \times 12 \times 11 \times 10 \times 9)/(1 \times 2 \times 3 \times 4 \times 5 \times 6) = 3003$$

Favourable number of cases

$$= {}^4C_2 \times {}^5C_2 \times {}^2C_2 \times {}^3C_2$$

$$= 6 \times 10 \times 1 \times 3 = 180$$

$$\therefore \text{Required probability}$$

$$= 180/3003 = 60/1001$$

**11.(3)** Total possible outcomes

$$= {}^{14}C = (14 \times 13 \times 12)/(1 \times 2 \times 3) = 364$$

No ball is green.

$\therefore$  Total favourable outcomes = selection of 3 marbles out of 5 blue, 2 red and 3 yellow marbles.

$$= {}^{10}C_3 = (10 \times 9 \times 8)/(1 \times 2 \times 3) = 120$$

$$\therefore \text{Required probability} = 120/364 = 30/91$$

**12.(1)** Total possible outcomes =  ${}^{14}C_4$

$$= (14 \times 13 \times 12 \times 11)/(1 \times 2 \times 3 \times 4) = 1001$$

Favourable outcomes

$$= {}^5C_2 \times {}^2C_2 = 10 \times 1 = 10$$

$$\therefore \text{Required probability} = 10/1001$$

**13.(4)** Total possible outcomes

$$= {}^{20}C_2 = (20 \times 19)/(1 \times 2) = 190$$

Total favourable outcomes

$$= {}^{13}C_2 + {}^7C_2 = (13 \times 12)/(1 \times 2) + (7 \times 6)/(1 \times 2)$$

$$= 78 + 21 = 99$$

$$\therefore \text{Required probability} = 99/190$$

**14.(1)** Total possible outcomes =  ${}^{52}C_1 = 52$

$$\text{Favourable outcomes} = 2 = {}^2C_1$$

$\therefore$  Required probability

$$= 2/52 = 1/26$$

**15.(1)** Total possible outcomes = Selection of 2 balls out of  $(9 + 7 + 4) = 20$  balls

$$= {}^{20}C_2 = (20 \times 19)/(1 \times 2) = 190$$

Favourable outcomes = Selection of 2 balls out of 9 red balls

$$= {}^9C_2 = (9 \times 8)/(1 \times 2) = 36$$

$$\therefore \text{Required probability}$$

$$= 36/190 = 18/95$$

**16.(2)** Total possible outcomes = 190

Favourable outcomes = Selection of 1 Ball out of 9 red balls and 1 ball from 7 white balls

$$= {}^9C_1 \times {}^7C_1 = 9 \times 7 = 63$$

$$\therefore \text{Required probability} = 63/190$$

**17.(2)** Total number of balls in the bag =  $3 + 5 + 7 = 15$

One ball is taken out.

$$\therefore \text{Total possible outcomes} = 15$$

Total favourable outcome = selection of 1 ball out of 10 balls = 10

$$\therefore \text{Required probability}$$

$$= 10/15 = 2/3$$

**18.(5)** Probability of the first ball to be red

**19.(5)** Total number of balls in the urn =  $6 + 5 + 3 = 14$

Total possible outcomes

$$= \text{Selection of 2 balls out of 14 balls} = {}^{14}C_2$$

$$= 14 \times 13 / 1 \times 2 = 91$$

The drawn balls are not of red colour.

Total favourable outcomes = Selection of 2 balls out of remaining 8 balls

$$= {}^8C_2 = (8 \times 7)/(1 \times 2)$$

$$\therefore \text{Required probability}$$

$$= 28/91 = 4/13$$

**20.** Total number of balls in the bag =  $4 + 5 + 6 = 15$

Total possible outcomes = Selection of 2 balls out of 15 balls

$$= {}^{15}C_2 = (15 \times 14)/(1 \times 2) = 105$$

Total favourable outcomes = Selection of 2 balls out of 4 orange and 6 pink balls

$$= {}^{10}C_2 = (10 \times 9)/(1 \times 2) = 45$$

$$\therefore \text{Required probability}$$

$$= 45/105 = 3/7$$

**21.(2)** Number of balls in the bag =  $6 + 8 = 14$

Total possible outcomes = Selection of 1 ball out of 14 calls

$$= {}^{14}C_1 = 14$$

Total favourable outcomes

$$= \text{Selection of 1 balls} = {}^8C_1 = 8$$

$$\therefore \text{Required probability}$$

$$= 8/14 = 4/7$$

**22.(3)** Prime numbers in 1, 2, 3, ..... 30.

$$= 2, 3, 5, 7, 11, 13, 17, 19, 23, 29 = 10$$

$$\text{Required probability} = 10/30 = 1/3$$

**23.(1)** There are 20 balls in the urn out of which 2 ball can be drawn in  ${}^{20}C_2$  ways.

$$\therefore \text{Total number of elementary events} = {}^{20}C_2 = 190$$

There are 9 red balls out of which 2 ball can be drawn in  ${}^9C_2$  ways.

$$\therefore \text{Favourable number of elementary events} = {}^9C_2$$

$$= (9 \times 8)/(1 \times 2) = 36$$

$$\therefore \text{Required probability} = 36/190 = 18/95$$

**24.(1)** Total possible outcomes = Selection of 4 children out of 8 boys and girls

$$= {}^8C_4 = (8 \times 7 \times 6 \times 5)/(1 \times 2 \times 3 \times 4) = 70$$





Favourable number of cases = Selection of 4 girls out of 5 girls

$$= {}^5C_4 = {}^5C_1 = 5 \quad [{}^nC_r = {}^nC_{n-r}]$$

∴ Required probability

$$= 5/70 = 1/14$$

**25.(4)** Total possible outcomes = Number of ways of picking 3 marbles out of 12 marbles = n(S)

$$= {}^{12}C_3 = (12 \times 11 \times 10)/(1 \times 2 \times 3) = 220$$

Favourable number of cases = n(E)

$$= {}^3C_3 + {}^4C_3 = 1 + 4 = 5$$

∴ Required Probability

$$= n(E)/n(S) = 5/220 = 1/44$$

**26.(5)** Total possible outcomes

$$= n(S) = {}^{12}C_2 = 12 \times 11/(1 \times 2) = 66$$

Favourable number of cases = n(E)

$$= {}^4C_2 = (4 \times 3)/(1 \times 2) = 6$$

∴ Required probability

$$= n(E)/n(S) = 6/66 = 1/11$$

**27.(2)** Total possible outcomes = n(S) =  ${}^{12}C_3 = 220$

Favourable number of cases n(E)

= Number of ways of picking 3 marbles (none is blue) out of 7 marbles

$$= {}^7C_3 = (7 \times 6 \times 5)/(1 \times 2 \times 3) = 35$$

∴ Required probability

$$= (1 - 35/220) = 1 - 7/44 = 37/44$$

**28.** Total possible outcomes = Total possible outcomes =

n(S) = Selection of 4 marbles out of 15 marbles.

$$= {}^{15}C_4 = (15 \times 14 \times 13 \times 12)/(1 \times 2 \times 3 \times 4) = 1365$$

When no marble is blue, favourable number of cases n(E)

= Selection of 4 marbles out of 11 marbles

$$= {}^{11}C_4 = (11 \times 10 \times 9 \times 8)/(1 \times 2 \times 3 \times 4) = 330$$

∴ Required probability =  $1 - n(E)/n(S)$

$$= 1 - 330/1365 = 1 - 22/91 = 69/91$$

**29.(5)** Total possible outcomes = n(S)

$$= {}^{15}C_2 = (15 \times 14)/(1 \times 2) = 105$$

Favourable number of cases

= n(E) Selection of 2 marbles out of 6 red marbles

$$= {}^6C_2 = (6 \times 5)/(1 \times 2) = 15$$

∴ Required probability

$$= n(E)/n(S) = 15/105 = 1/7$$

**30.(3)** Total possible outcomes = n(S)

$$= {}^{15}C_3 = (15 \times 14 \times 13)/(1 \times 2 \times 3) = 455$$

Favourable no. of cases

$$= n(E) = {}^4C_2 \times {}^3C_1$$

$$= (4 \times 3)/(1 \times 2) \times 3 = 18$$

∴ Required probability = 18/455

**31.(1)** Total possible outcomes = n(S)

$$= {}^{15}C_4 = 1365$$

Favourable number of cases =  ${}^2C_1 \times {}^4C_2 \times {}^6C_1$

$$2 \times (4 \times 3)/(1 \times 2) \times 6 = 72$$

∴ Required probability = 72/1365 = 24/455

**32.(4)** Total possible outcomes = n(S) =  ${}^{15}C_2 = 105$

Favourable number of cases

$$= n(E) = {}^2C_2 + {}^3C_2 = 1 + 3 = 4$$

∴ Required probability = 4/105

**33.(2)** Total number of balls in the bag = 9 + 5 = 14

Two balls are drawn

∴ Total possible outcomes

$$= {}^{14}C_2 = (14 \times 13)/(1 \times 2) = 91$$

Both the balls should be either white or black.

∴ Favourable outcomes

$$= {}^9C_2 + {}^5C_2 = (9 \times 8)/(1 \times 2) + (5 \times 4)/(1 \times 2)$$

$$= 36 + 10 = 46$$

∴ Required probability = 46/91

**34.(1)** Dice is thrown twice.

∴ Total possible outcomes = 6 × 6 = 36

Pairs whose sum is 9 = (3, 6) (6, 3) (4, 5) and (5, 4)

∴ Favourable probability = 4/36 = 1/9

**35.(1)** Total balls in the bag

$$= 6 + 4 + 8 = 18$$

Total possible outcomes = selection of 3 balls out of 18 balls =

$${}^{18}C_3 = (18 \times 17 \times 16)/(1 \times 2 \times 3) = 816$$

Favourable outcomes = Selection of 2 balls out of 6 red balls and that of 1 ball out of 4 green balls

$$= {}^6C_2 \times {}^4C_1 = 6 \times 5/2 \times 4 = 60$$

∴ Required probability = 60/816 = 5/68

**36.(2)** Total possible outcomes =  ${}^{18}C_1 = 18$

Total possible outcomes =  ${}^{18}C_1 = 18$

Total favourable outcomes = selection of 1 ball out of 8 yellow balls =  ${}^8C_1 = 8 = 4/9$

∴ Required Probability = 8/18 = 4/9

**37.(3)** Total possible outcomes

$$= {}^{18}C_2 = (18 \times 17)/1 \times 2 = 153$$

Total favourable outcomes

$$= {}^6C_2 + {}^4C_2 + {}^8C_2$$

$$= (6 \times 5)/(1 \times 2) + (4 \times 3)/(1 \times 2) + (8 \times 7)/(1 \times 2)$$

$$= 15 + 6 + 28 = 49$$

Required probability = 49/153

**38.(3)** Total possible outcomes

= selection of 2 balls out of 12 balls

$$= {}^{12}C_2 = (12 \times 11)/(1 \times 2) = 66$$

Favourable outcomes = selection of 2 balls out of 7 blue balls

$$= {}^7C_2 = 7 \times 6/(1 \times 2) = 21$$

∴ Required probability

$$= 21/66 = 7/22$$

**39.(4)** Total possible outcomes

$$= 6 \times 6 = 36$$

Favourable outcomes

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

∴ Required probability

$$= 6/36 = 1/6$$

Calculations (18 - 20)

$$\text{males} = 2/3 \times 240 = 160$$

Females = 80

$$\text{Graduate males} = 15 \times 160/100 = 24$$

$$\text{Non-graduate males} = 160 - 24 = 136$$

$$\text{Graduate females} = (80 \times 3)/4 = 60$$

$$\text{Non-graduate females} = 20$$

$$\text{40.(3) Required answer} = 24 - 20 = 4$$

$$\text{41.(5) Required answer} = 60 + 136 = 196$$

**42.(2)** Required ratio

$$= 160 : 20 = 8 : 1$$

**43.(1)** Total balls in the bag

$$= 6 + 4 + 8 = 18$$

Total possible outcomes = selection of 3 balls out of 18 balls

$${}^{18}C_3 = (18 \times 17 \times 16)/(1 \times 2 \times 3) = 816$$

Favourable outcomes = selection of 2 balls out of red balls

and that of 1 ball out of 4 green balls

$$= {}^6C_2 \times {}^4C_1 = (6 \times 5)/2 \times 4 = 60$$

∴ Required probability

$$= 60/816 = 5/68$$

**44.(2)** Total possible outcomes

$$= {}^{18}C_1 = 18$$

Total favourable outcomes = selection of 1 ball out of 8 yellow balls =  ${}^8C_1 = 8$

∴ Required probability = 8/18 = 4/9



**45.(3)** Total possible outcomes

$$= {}^{18}C_2 + {}^4C_2 + {}^8C_2$$

$$= (6 \times 5)/(1 \times 2) + (4 \times 3)/(1 \times 2) + (8 \times 7)/(1 \times 2)$$

$$= 15 + 6 + 28 = 49$$

Required probability =  $49/153$

**46.(3)** Total number of shirts in the bag =  $4 + 5 + 6 = 15$

Total possible outcomes Selection of 3 shirts out of 15 shirts =  ${}^{15}C_3$

$$= (15 \times 14 \times 13)/(1 \times 2 \times 3) = 455$$

Favourable outcomes = selection of 1 blue shirt out of 4 blue shirts and selection of 2 shirts out of remaining 11 shirts

$$= {}^4C_1 \times {}^{11}C_2 = 4 \times (11 \times 10)/2 = 220$$

∴ Required probability

$$= 220/455 = 44/91$$

**47.(3)** Total possible outcomes =  ${}^{15}C_1 = 15$

Favourable outcomes = Selection of 1 red shirt or selection of 1 yellow shirt.

$$= {}^5C_1 + {}^6C_1 = 5 + 5 = 11$$

∴ Required probability =  $11/15$

**48.(3)** Total possible outcomes =  ${}^{15}C_2 = (15 \times 14)/(1 \times 2) = 105$

Favourable outcomes = Selection of 2 blue shirts out of 4 blue shirts

$$= {}^4C_2 = (4 \times 3)/(1 \times 2) = 6$$

∴ Required probability =  $6/105 = 2/35$

**49.(4)** Total number of balls in the bag =  $4 + 4 + 2 = 10$

Total possible outcomes = Selection of 2 balls out of 10 balls

$$= {}^{10}C_2 = (10 \times 9)/(1 \times 2) = 45$$

Favourable outcomes = 1 green ball and 1 ball of other colour + 2 green balls

$$= {}^2C_1 \times {}^8C_1 + {}^2C_2 = 2 \times 8 + 2 = 18$$

∴ Required probability

$$= 18/45 = 2/5$$

**50.(3)** Total number of balls in the bag

$$= 5 + 6 + 3 = 14$$

Total possible outcomes

= Selection of 2 balls out of 14 balls

$$= {}^{14}C_2 = (14 \times 13)/(1 \times 2) = 91$$

Favourable outcomes = Selection of 2 balls out of 5 red balls + selection of 2 balls out of 3 green balls =  ${}^5C_2 + {}^3C_2$

$$= (5 \times 4)/(1 \times 2) + (3 \times 2)/(1 \times 2) = 10 + 3$$

$$= 13$$

∴ Required probability

$$= 13/91 = 1/9$$

**51.(3)** Total number of balls

$$= 4 + 6 + 5 = 15$$

Total possible outcomes = selection of 3 balls out of 15 balls

$$= {}^{15}C_3 = (15 \times 14 \times 13)/(1 \times 2 \times 3)$$

$$= 455$$

Total favourable outcomes = selection of 2 balls out of 6 green balls and selection of 1 ball out of 5 blue balls

$$= {}^6C_2 \times {}^5C_1 = (6 \times 5)/(1 \times 2) \times 5$$

$$= 75$$

∴ Required probability

$$= 75/455 = 15/91$$

**52.(2)** Total no. of cases =  ${}^7C_2 = 21$

Favourable no. of cases =  ${}^5C_2 = 10$

∴ Required probability =  $10/21$

**53.(5)** Total number of marbles in the urn = 15

P(S) = Total possible outcomes = Selection of 2 marbles at random out of 15 marbles

$$= {}^{15}C_2 = (15 \times 14)/(1 \times 2) = 105$$

P(E) Favourable outcomes

= Selection of 2 marbles at random out of 2 green marbles  ${}^2C_2 = 1$

∴ Required probability

$$= P(E)/P(S) = 1/105$$

**54.(3)** P(S) =  ${}^{15}C_3$

$$= (15 \times 14 \times 13)/(1 \times 2 \times 3)$$

$$= 455$$

P(E) = Selection of 2 marbles out of 6 blue marbles and that of one marbles out 4 yellow marbles

$$= {}^8C_2 \times {}^4C_1 = (6 \times 5)/(1 \times 2) \times 4 = 60$$

∴ Required probability

$$= P(E)/P(S) = 60/455 = 12/91$$

**55.(2)** P(S) =  ${}^{15}C_4$

$$= (15 \times 14 \times 13 \times 12)/(1 \times 2 \times 3 \times 4) = 1365$$

Let no yellow marble is selected.

∴ P(E) Selection of 4 marbles out of 11 marbles

$$= {}^{11}C_4 = (11 \times 10 \times 9 \times 8)/(1 \times 2 \times 3 \times 4) = 300$$

∴ Required probability =  $1 - 300/1365 = 1 - 22/91 = 91 - 22/91 = 69/91$

**56.(2)** P(S) =  ${}^{15}C^2 = 105$

$$P(E) = {}^3C_2 + {}^2C_2$$

$$= (3 \times 2)/(1 \times 2) + 1 = 4$$

∴ Required probability =  $4/105$

**57.(3)** P(S) =  ${}^{15}C_4 = 1365$

$$P(E) = {}^2C_1 \times {}^6C_2 \times {}^3C_1$$

$$= 2 \times 15 \times 3 = 90$$

∴ Required probability = P(S) / P(E)

$$= 90/1365 = 6/91$$

**58.(3)** Total possible outcomes

$$= {}^{17}C_5 = (17 \times 16 \times 15 \times 14 \times 13)/(1 \times 2 \times 3 \times 4 \times 5)$$

$$= 6188$$

Total favourable outcomes

$$= {}^8C_2 \times {}^4C_1 \times {}^5C_2$$

$$= (8 \times 7)/(1 \times 2) \times 4 (5 \times 4)/(1 \times 2)$$

$$= 28 \times 4 \times 10 = 1120$$

Required probability

$$= 1120/6188 = 280/1547$$

**59.(3)** Total balls in bag A

$$= 4 + 6 = 10$$

Green balls = 4

Probability that ball is green

$$= 4/10$$

Total balls in bag B = 7

Green balls = 3

$$= 3/7$$

∴ Total probability =  $4/10 \times 3/7$

$$= 12/70 = 6/35$$

**60.(4)** Out of 14 eggs, 8 eggs are rotten.

Hence, 6 eggs are not rotten

Total possible outcomes

= Selection of 2 eggs out of 14 eggs

$$= {}^{14}C_2 = (14 \times 13)/(1 \times 2) = 91$$

Total favourable outcomes = Selection of 2 eggs out of 6 fresh eggs

$$= {}^6C_2 = (6 \times 5)/(1 \times 2) = 15$$

∴ Required probability =  $15/91$

**61.(3)** Total balls in bag A

$$= 4 + 6 = 10$$

Green balls = 4



Probability that ball is green =  $4/10$

Total balls in bag B = 7

Green balls = 3

Probability that ball is green =  $3/7$

$\therefore$  Total probability =  $4/10 \times 3/7$

=  $12/70 \times 6/35$

**62.**(4) Total possible outcomes

=  ${}^{13}C_2 + {}^7C_2$

=  $(13 \times 12)/(1 \times 2) + (7 \times 6)/(1 \times 2)$

=  $78 + 21 = 99$

$\therefore$  Required probability =  $99/190$

**63.**(3) Total balls =  $4 + 3 + 5 = 12$

Out of 12, we are drawing 2 balls at random

The 2 balls can be drawn in  ${}^{12}C_2$  ways. Then probability

both balls are of same colour

=  ${}^4C_2 + {}^3C_2 + {}^5C_2 / {}^{12}C_2 = (3 + 6 + 10)/(6 \times 11) = 19/66$

**64.**(3) Three balls are drawn.

$\therefore$  Total possible outcomes

=  ${}^{18}C_3 = (18 \times 17 \times 16)/(1 \times 2 \times 3) = 816$

Favourable outcomes – Selection of two balls out of 5 red

balls and that of 1 ball from 7 blue balls

=  ${}^5C_2 \times {}^7C_1 = 10 \times 7 = 70$

$\therefore$  Required probability =  $70/816 = 35/408$

**65.**(2) n(S) = Number of ways of selecting 3 marbles out

of 7 marbles =  ${}^7C_3$

=  $(7 \times 6 \times 5)/(1 \times 2 \times 3) = 35$

n(E) = Number of ways of selecting 2 green marbles out

1 red marbles

=  ${}^4C_2 \times {}^3C_1 = (4 \times 3)/(1 \times 2) \times 3 = 18$

$\therefore$  Required probability

=  $n(E)/n(S) = 18/35 = 0.52$

**66.**(2) Favourable number of cases

=  $(40 \times 70)/100 + (30 \times 80)/100$

=  $28 + 24 = 52$

$\therefore$  Required probability =  $52/100 = 0.52$

**67.**(1) Total possible outcomes

= Selection of 2 eggs pit of 28

=  ${}^{28}C_2 = 28 \times 27/(1 \times 2) = 14 \times 27$

Favourable outcomes

= Selection 1 unrotten egg out 20 and 1 rotten egg out

of 8 + selecting 2 rotten eggs out 8 =  ${}^{20}C_1 \times {}^8C_1 + {}^8C_2$

=  $160 + 8 \times 7/2 = 188$

$\therefore$  Required probability

=  $188/14 \times 27 = 94/7 \times 27 = 94/189$

**68.**(2) Required probability =  $3/8$

[ $\therefore$  Total sector = 8

Sectors having even No. = 3]

**69.**(1) Required probability =  $1/5$

**70.**(1) Total number of balls in the urn =  $5 + 6 + 7 = 18$

Two balls are drawn.

$\therefore$  Total possible outcomes

=  ${}^{18}C_2 = (18 \times 17)/(1 \times 2) = 153$

Favourable outcomes

=  ${}^5C_2 = 5 \times 4/(1 \times 2) = 10$

$\therefore$  Required probability =  $10/153$

**71.**(2) Total possible outcomes

=  ${}^{18}C_2 = (18 \times 17)/(1 \times 2) = 153$

Favourable outcomes =  ${}^6C_2$

=  $(6 \times 5)/(1 \times 2) = 15$

$\therefore$  Required Probability =  $15/153$

=  $5/51$

**72.**(5) Total number of balls in the box =  $4 + 4 + 6 = 14$

Total possible outcomes

= Selection of 2 balls out of 14 balls =  ${}^{14}C_2 = (14 \times 13)/(1$

$\times 2) = 91$

Total favourable outcomes = Selection of 1 ball out of 6

blue balls and other ball out 8 remaining balls +

Selection of 2 balls out of 6 blue balls

=  ${}^6C_1 + {}^8C_1 + {}^6C_2$

=  $6 \times 8 + (6 \times 5)(1 \times 2) = 48 + 15 = 63$

$\therefore$  Required probability =  $63/91$

=  $9/13$

**73.**(5) Total possible outcomes =  ${}^{14}C_1 = 14$

Total favourable outcomes

=  ${}^4C_1 + {}^6C_1 = 4 + 6 = 10$

$\therefore$  Required probability

=  $10/14 = 5/7$

**74.**(4) Total possible outcomes

=  ${}^{14}C_3 = (14 \times 13 \times 12)/(1 \times 2 \times 3) = 364$

Total favourable outcomes

=  ${}^4C_1 \times {}^{10}C_1 = 4 \times 10 = 40$

$\therefore$  Required probability =  $40/364 = 10/91$

**75.**(1) There are 10 balls in the bag.

Total possible outcomes = Selection of 2 balls out of 10

balls

=  ${}^{10}C_2 = (10 \times 9)/(1 \times 2) = 45$

Total favourable outcomes

= Selection of 2 balls out of 6 red balls + selection of 2

balls out of 4 yellow balls

=  ${}^6C_2 + {}^4C_2$

=  $(6 \times 5)/(1 \times 2) + (4 \times 3)/(1 \times 2)$

=  $15 + 6 = 21$

$\therefore$  Required probability

=  $21/45 = 7/15$

**76.**(5) Total balls in the bag

=  $7 + 8 = 15$

Total possible outcomes = Selection of 2 balls out of 15

balls

=  ${}^{15}C_2 = (15 \times 14)/(1 \times 2) = 105$

Total favourable outcomes = Selection of 2 balls out of

yellow balls + Selection of 2 balls out of 7 red balls

=  ${}^8C_2 + {}^7C_2 = (8 \times 7)/(1 \times 2) + (7 \times 6)/(1 \times 2)$

=  $28 + 21 = 49$

Required probability

=  $49/105 = 7/15$

