

Ch-16

Probability

Exercise 16.1

Q.1 $P(E) = 0.85$

$$P(E) + P(\bar{E}) = 1$$

$$P(\bar{E}) = 1 - P(E)$$

$$= 1 - 0.85$$

$$= \boxed{0.15}$$

Q.2 Total outcomes on die = 6

(ii) 2 or 4

$$P(2 \text{ or } 4) = \frac{2}{6} = \frac{1}{3} = \boxed{\frac{1}{3}}$$

(iii) Multiple of 2 or 3

$$P(2, 3, 4, 6) = \frac{4}{6} = \frac{2}{3} = \boxed{\frac{2}{3}}$$

(iv) An even prime no.

$$P(2) = \frac{1}{6} = \boxed{\frac{1}{6}}$$

(v) A no. greater than 5

$$P(6) = \frac{1}{6} = \boxed{\frac{1}{6}}$$

(vii) A composite no.

$$P(1, 4, 6) = \frac{2}{6} = \frac{1}{3} = \boxed{\frac{1}{3}}$$

Q.3 Total outcomes = 8 (HHH, HHT, HTH, HTT, THH, THT, TTH, TTT)

(i) Exactly 2 heads

$$P(\text{HHT, HTH, THH}) = \frac{\cancel{3}}{\cancel{8}} = \frac{3}{8}$$

(ii) at most 2 heads

$$P(\text{HHT, HTT, THT, TTH}) = \frac{5}{8}$$

(iii) at least one head & one tail

$$P(\text{HHT, HTH, HTT, THT, TTH}) = \frac{\cancel{6}}{\cancel{8}} = \frac{3}{4}$$

(iv) No tail

$$P(\text{HHH}) = \frac{1}{8}$$

Q. 4 Total outcomes = 36

Possible outcomes = 6 [(4, 6), (5, 5), (5, 6), (6, 4), (6, 5), (6, 6)]

$$P = \frac{\cancel{6}}{\cancel{36}} = \frac{1}{6}$$

Q. 5 Total outcomes = 36

Possible outcomes = 3 [(5, 6), (6, 5), (6, 6)]

$$P = \frac{\cancel{3}}{\cancel{36}} = \frac{1}{12}$$

Q. 6 Total outcomes = 52

(i) a black king

$$P(\text{black king}) = \frac{\cancel{1}}{\cancel{52}} = \frac{1}{26}$$

- (ii) either a black card or a king
Possible outcomes = 26 black cards + 2 red kings
= 28

$$P = \frac{28}{52} = \frac{7}{13}$$

- (iii) black and a king

$$P = \frac{2}{52} = \frac{1}{26}$$

- (iv) a jack, king or queen
 $P = \frac{1 \times 3}{52} = \frac{3}{13}$

- (v) Neither a heart nor a king
Heart & king = 13 + 3
= 16

Possible outcomes = 52 - 16 = 36

$$P = \frac{36}{52} = \frac{9}{13}$$

- (vi) spade or an ace

Possible outcomes = 13 + 3 = 16

$$P = \frac{16}{52} = \frac{4}{13}$$

- (vii) Neither an ace or a king

Possible outcomes = 52 - (4 + 4) = 52 - 8 = 44

$$P = \frac{44}{52} = \frac{11}{13}$$

(viii) neither a red card nor a queen.

$$\text{Possible outcomes} = 52 - (26 + 2) \\ = 52 - 28 = 24$$

$$P = \frac{24}{52} = \frac{6}{13}$$

(ix) Other than ace

$$P = \frac{48}{52} = \frac{12}{13}$$

(x) A ten

$$P = \frac{4}{52} = \frac{1}{13}$$

(xi) A spade

$$P = \frac{13}{52} = \frac{1}{4}$$

(xii) A black card

$$P = \frac{26}{52} = \frac{1}{2}$$

(xiii) The seven of clubs

$$P = \frac{1}{52}$$

(xiv) Jack

$$P = \frac{4}{52} = \frac{1}{13}$$

(xv) The ace of spades

$$P = \frac{1}{52}$$

(xvi) A queen

$$P = \frac{4}{52} = \frac{1}{13}$$

(xvii) A heart

$$P = \frac{13}{52} = \frac{1}{4}$$

(xviii) A red card

$$P = \frac{26}{52} = \frac{1}{2}$$

(xix) neither a king nor a queen

$$\text{Possible outcomes} = 52 - (4 + 4) = 52 - 8 = 44$$

$$P = \frac{44}{52} = \frac{11}{13}$$

14/09/2020

classmate

Date _____

Page _____

ch-16
exercise 16.1

Q.7 No. of lottery tickets = 50
No. of favourable outcomes = 15 (2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 37, 41, 43, 47)

$$P(\text{Prime no.}) = \frac{15}{50} = \frac{3}{10}$$

Q.8 Red balls = 10
White balls = 8
Total balls = 10 + 8
= 18

$$P(\text{White ball}) = \frac{8}{18} = \frac{4}{9}$$

Q.9 Black balls = 5
Red balls = 3
White balls = 4
Total balls = 5 + 3 + 4 = 12

(i) white?

$$P = \frac{4}{12} = \frac{1}{3}$$

(ii) red?

$$P = \frac{3}{12} = \frac{1}{4}$$

(iii) black?

$$P = \frac{5}{12}$$

(iv) not red?

$$P(\text{not red}) = 1 - P(\text{red})$$

$$= 1 - \frac{1}{4} = \frac{4-1}{4} = \frac{3}{4}$$

$$= \frac{3}{4}$$

Q.10 Total outcomes = 15

Possible outcomes = 3 (4, 8, 12)

$$P(\text{multiple of 4}) = \frac{3}{15} = \frac{1}{5}$$

Q.11 Total balls = 6 + 8 + 4
= 18

Possible outcomes = 6 red + 4 white

$$= 10 \text{ balls}$$

$$P(\text{not black}) = \frac{10}{18} = \frac{5}{9}$$

Q.12 Total balls = 5 white + 7 red
= 12 balls

$$P(\text{white ball}) = \frac{5}{12}$$

Q.13 No. of tickets = 20

Possible outcomes = 8 (3, 6, 7, 9, 12, 14, 15, 18)

$$P(\text{multiple of 3 or 7}) = \frac{8}{20} = \frac{2}{5}$$

Q.14 Total outcomes = 10 prizes + 25 blanks
= 35

$$P(\text{prize}) = \frac{10}{35} = \frac{2}{7}$$

Q.15 $P(\text{winning}) = 0.3$
 $P(\text{losing}) = 1 - P(\text{winning})$
 $= 1 - 0.3$
 $= 0.7$

Q.16 Total balls = 5 black + 7 red + 3 white
= 15

(i) Red?

$$P(\text{red}) = \frac{7}{15}$$

(ii) not black?

$$P(\text{not black}) = \frac{7+3}{15}$$

(iii) black or white?

$$P(\text{black or white}) = \frac{5+3}{15}$$

$$= \frac{8}{15}$$

(iv) Red or white?

$$P(\text{red or white}) = \frac{7+3}{15} = \frac{10}{15} = \frac{2}{3}$$

Q.19 Total outcomes = 5 (10, Q, K, J, A)

(i) Queen?

$$P = \frac{1}{5}$$

(ii) Total cards now = 4

(i) ace?

$$P = \frac{1}{4}$$

(ii) king?

$$P = \frac{1}{4}$$

15/09/2020

classmate

Date _____

Page _____

Ch-16

Exercise 16.1

Q.21 Total outcomes = 12

(i) 10?

$$P = \frac{1}{12}$$

(ii) an odd no.?

Possible outcomes = 6 (1, 3, 5, 7, 9, 11)

$$P(\text{odd}) = \frac{6}{12} = \frac{1}{2}$$

(iii) multiple of 3?

Possible outcomes = 4 (3, 6, 9, 12)

$$P(\text{multiple of 3}) = \frac{4}{12} = \frac{1}{3}$$

(iv) an even no.?

Possible outcomes = 6 (2, 4, 6, 8, 10, 12)

$$P(\text{even}) = \frac{6}{12} = \frac{1}{2}$$

Q.22 Total outcomes = 18 girls + 16 boys
= 34

$$(i) P(\text{girl}) = \frac{18}{34} = \frac{9}{17}$$

$$(ii) P(\text{boy}) = \frac{16}{34} = \frac{8}{17}$$

Q. 24 Total outcomes = 10

Possible outcomes = 3 (2, 3, 4)

$$P = \frac{3}{10}$$

Q. 25 Total outcomes = 30

~~Possible outcomes = 10~~

No. divisible by 3 = 10 (3, 6, 9, 12, 15, 18, 21, 24, 27, 30)

Possible outcomes = $30 - 10 = 20$

$$P = \frac{20}{30} = \frac{2}{3}$$

Q. 26 Total balls = 5 red + 8 white + 7 black
= 20

(i) red or white?

$$P = \frac{5 + 8}{20} = \frac{13}{20}$$

(ii) not black?

$$P = \frac{5 + 8}{20} = \frac{13}{20}$$

(iii) neither white nor black?

$$P = \frac{5}{20} = \frac{1}{4}$$

Q. 27 Total outcomes = 25

Prime no. = 9 (2, 3, 5, 7, 11, 13, 17, 19, 23)

Non-prime = $25 - 9 = 16$

$$P(\text{non-prime}) = \frac{16}{25}$$

Q.28 Total balls = 8 red + 6 white + 4 black
= 18 balls

(i) red or white?

$$P = \frac{8+6}{18} = \frac{14}{18} = \frac{7}{9}$$

(ii) not black?

$$P = \frac{8+6}{18} = \frac{14}{18} = \frac{7}{9}$$

(iii) neither white nor black?

$$P = \frac{8}{18} = \frac{4}{9}$$

2/09/2020

classmate

Date _____

Page _____

Ch - 16 Exercise 16.1

Q.29 Total outcomes = 35

(i) Prime no. ?

Possible outcomes = 11 (2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31)

$$P = \frac{11}{35}$$

(ii) Multiple of 7 ?

Possible outcomes = 5 (7, 14, 21, 28, 35)

$$P = \frac{5}{35} = \frac{1}{7}$$

(iii) Multiple of 3 or 5 ?

Possible outcomes = 16 (3, 5, 6, 9, 10, 12, 15, 18, 20, 21, 24, 25, 27, 30, 33, 35)

$$P = \frac{16}{35}$$

Q.30 Total cards = 52 - (4 × 2)

$$= 52 - 8 = 44$$

(i) $P(\text{black queen}) = \frac{2}{44} = \frac{1}{22}$

(ii) $P(\text{red card}) = \frac{26-8}{44} = \frac{18}{44} = \frac{9}{22}$

(iii) a black jack?

$$P(\text{a black jack}) = \frac{2}{44} = \frac{1}{22}$$

$$(iv) P(\text{picture card}) = \frac{2 \times 3}{44} = \frac{6}{22} = \frac{3}{11}$$

$$Q.32 \quad P(2 \text{ students having birthday}) = 0.992$$

$$P(2 \text{ students not having birthday}) = 1 - 0.992 = 0.008$$

$$Q.33 \quad \text{Total balls} = 3 \text{ red} + 5 \text{ black} = 8$$

(i) red?

$$P(\text{red}) = \frac{3}{8}$$

(ii) not red?

$$P(\text{not red}) = \frac{5}{8}$$

$$Q.38 \quad \text{Total outcomes} = 4 [(HH), (HT), (TH), (TT)]$$

$$\text{Possible outcomes} = 3 [(HH), (HT), (TH)]$$

$$P(\text{at least one head}) = \frac{3}{4}$$

$$Q.39 \quad \text{Total cards (from 13 to 60)} = 60 - 12 = 48$$

(i) Possible outcomes = 10 (15, 20, 25, 30, 35, 40, 45, 50, ~~55~~, 60)

$$P = \frac{10}{60} = \frac{1}{6}$$

(ii) Possible outcomes = 4 (16, 25, 36, 49)

$$P = \frac{4}{49} = \frac{4}{49}$$

Q.40 Total tickets (from 11 to 30) = 30 - 10
= 20

(i) multiple of 7 =

$$P(\text{multiple of } 7) = \frac{3}{20}$$

(ii) no. greater than 15 & a multiple of 5
Possible outcomes = 3 (20, 25, 30)

$$P = \frac{3}{20}$$

Q.43 Total cards = 100 red + 200 yellow + 50 blue
= 350 cards

(i) blue card

$$P = \frac{50}{350} = \frac{1}{7}$$

(ii) neither yellow nor blue

$$P = \frac{350 - (200 + 50)}{350}$$

$$= \frac{350 - 250}{350} = \frac{100}{350}$$

(ii) not a yellow card

$$P = \frac{100 + 50}{350} = \frac{150}{350} = \frac{3}{7}$$

$$= \frac{2}{7}$$

Q.44 Total cards = 18
Possible outcomes = 11 (3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 37)

$$P(\text{prime no.}) = \frac{11}{18}$$

Q.45 Total persons = 12
No. of patient persons = 3
No. of honest persons = 6
No. of kind persons = $12 - (3 + 6)$
 $= 12 - 9 = 3$

(i) extremely patient

$$P = \frac{3}{12} = \frac{1}{4}$$

(ii) kind or honest

$$P = \frac{6+3}{12} = \frac{9}{12} = \frac{3}{4}$$

Q.46 Total cards = 30

(i) not divisible by 3.

Possible outcomes = 20 (1, 2, 4, 5, 7, 8, 10, 11, 13, 14, 16, 17, 19, 20, 22, 23, 25, 26, 28, 29)

$$P = \frac{20}{30} = \frac{2}{3}$$

(ii) prime no. greater than 7

Possible outcomes = 6 (11, 13, 17, 19, 23, 29)

$$P = \frac{6}{30} = \frac{1}{5}$$

(iii) not a perfect square

Possible outcomes = 25 (2, 3, 5, 6, 7, 8, 10, 11, 12, 13, 14, 15, 17, 18, 19, 20, 21, 22, 23, 24, 26, 27, 28, 29, 30)

$$P = \frac{25}{30} = \frac{5}{6}$$

Q.47
Total coins = 100 (₹ 0.5) + 50 (₹ 1) + 20 (₹ 2) + 10 (₹ 5)
= 180

(i) 50 p

$$P = \frac{100}{180} = \frac{5}{9}$$

(ii) more than ₹ 1

$$P = \frac{20 + 10}{180} = \frac{30}{180} = \frac{1}{6}$$

(iii) less than ₹ 5

$$P = \frac{100 + 50 + 20}{180} = \frac{170}{180} = \frac{17}{18}$$

(iv) ₹ 1 or ₹ 2

$$P = \frac{50 + 20}{180} = \frac{70}{180} = \frac{7}{18}$$

Q.48 Total cards = 49

(i) odd no.

Possible outcomes = 25 (1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31, 33, 35, 37, 39, 41, 43, 45, 47, 49)

$$P = \frac{25}{49}$$

(ii) multiple of 5

Possible outcomes = 9 (5, 10, 15, 20, 25, 30, 35, 40, 45)

$$P = \frac{9}{49}$$

(iii) perfect square

Possible outcomes = 7 (1, 4, 9, 16, 25, 36, 49)

$$P = \frac{7}{49} = \frac{1}{7}$$

(iv) even prime no.

Possible outcome = 1 (2)

$$P = \frac{1}{49}$$

Q. 49 Total cards = 20

(i) divisible by 2 or 3

Possible outcomes = 13 (2, 3, 4, 6, 8, 9, 10, 12, 14, 15, 16, 18, 20)

$$P = \frac{13}{20}$$

(ii) a prime no.

Possible outcomes = 8 (2, 3, 5, 7, 11, 13, 17, 19)

$$P = \frac{8}{20} = \frac{2}{5}$$

Q. 50 Total outcomes = 36

(i) 8 as the sum

Possible outcomes = 5 [(2, 6), (3, 5), (4, 4), (5, 3), (6, 2)]

$$P = \frac{5}{36}$$

(ii) a doublet

Possible outcomes = 6 [(1, 1), (2, 2), (3, 3), (4, 4), (5, 5), (6, 6)]

$$P = \frac{6}{36} = \frac{1}{6}$$

(iii) a doublet of prime no.

Possible outcomes = 3 [(2, 2), (3, 3), (5, 5)]

$$P = \frac{3}{36} = \frac{1}{12}$$

(iv) a doublet of odd no.

Possible outcomes = 3 [(1, 1), (3, 3), (5, 5)]

$$P = \frac{3}{36} = \frac{1}{12}$$

(v) sum greater than 9

Possible outcomes = 6 [(4, 6), (5, 5), (5, 6), (6, 4), (6, 5), (6, 6)]

$$P = \frac{6}{36} = \frac{1}{6}$$

(vi) an even no. on first

Possible outcomes = 18 $[(1, 2), (1, 4), (1, 6), (2, 1), (2, 4), (2, 6), (3, 2), (3, 4), (3, 6)]$

$[(2, 1), (2, 2), (2, 3), (2, 4), (2, 5), (2, 6), (4, 1), (4, 2), (4, 3), (4, 4), (4, 5), (4, 6), (6, 1), (6, 2), (6, 3), (6, 4), (6, 5), (6, 6)]$

$$P = \frac{18}{36} = \frac{1}{2}$$

(vii) even no. on one & multiple of 3 on the other.

Possible outcomes = 11 $[(2, 3), (2, 6), (4, 3), (4, 6), (6, 3), (6, 6), (3, 2), (3, 4), (3, 6), (6, 2), (6, 4)]$

$$P = \frac{11}{36}$$

(viii) neither 9 or 11 as the sum

Outcomes which have 9 & 11 as the sum = 6 $[(3, 6), (4, 5), (5, 4), (5, 6), (6, 3), (6, 5)]$

Possible outcomes = $36 - 6 = 30$

$$P = \frac{30}{36} = \frac{5}{6}$$

(ix) sum less than 6

Possible outcomes = 10 $[(1, 1), (1, 2), (1, 3), (1, 4), (2, 1), (2, 2), (2, 3), (3, 1), (3, 2), (4, 1)]$

$$P = \frac{10}{36} = \frac{5}{18}$$

(x) sum less than 7

Possible outcomes = 15 $[(1,1), (1,2), (1,3), (1,4), (1,5),$
 $(2,1), (2,2), (2,3), (2,4), (3,1),$
 $(3,2), (3,3), (4,1), (4,2), (5,1)]$

$$P = \frac{15}{36} = \frac{5}{12}$$

(xi) sum more than 7

Possible outcomes = 15 $[(2,6), (3,5), (3,6), (4,4), (4,5),$
 $(4,6), (5,3), (5,4), (5,5), (5,6),$
 $(6,2), (6,3), (6,4), (6,5), (6,6)]$

$$P = \frac{15}{36} = \frac{5}{12}$$

(xii) 5 atleast once

Possible outcomes = 11 $[(1,5), (2,5), (3,5), (4,5), (5,5),$
 $(6,5), (5,1), (5,2), (5,3), (5,4),$
 $(5,6)]$

$$P = \frac{11}{36}$$

(xiii) No. other than 5

No. which have 5 atleast once = 11

Possible outcomes = $36 - 11$

$$= 25$$

$$P = \frac{25}{36}$$

(xiv) even no. on each die

Possible outcomes = 9 $[(2,2), (2,4), (2,6), (4,2), (4,4),$
 $(4,6), (6,2), (6,4), (6,6)]$

$$P = \frac{4}{36} = \frac{1}{9}$$

1
9

(xv) 5 as the sum

Possible outcomes = 4 [(1, 4), (2, 3), (3, 2), (4, 1)]

$$P = \frac{4}{36} = \frac{1}{9}$$

1
9

(xvi) 2 will come atleast once

Possible outcomes = 11 [(1, 2), (2, 2), (3, 2), (4, 2), (5, 2),
(6, 2), (2, 1), (2, 3), (2, 4),
(2, 5), (2, 6)]

$$P = \frac{11}{36}$$

11
36

(xvii) 2 will not come either time

Outcomes in which = 11

2 will come

Possible outcomes = 36 - 11
= 25

$$P = \frac{25}{36}$$

25
36

Q.51 Days in ordinary year = 365 days
Weeks in ordinary year = 52 weeks + 1 day

Sundays in a year = 52

Total outcomes of the = 7

remaining one day

Favourable outcome (Sunday) = 1

$$P = \frac{1}{7}$$

1
7

Q-52 Days in leap year = 366
 Weeks in leap year = 52 weeks + 2 days

Sundays & Mondays in = 52
 leap year

Total outcomes of remaining = 14 [2 (Mon, Tue, wed,
 2 days Thurs, Fri, Sat, Sun)]

~~the~~ Favourable outcomes = 2

$$P(\text{Sunday \& Monday}) = \frac{2}{147} = \frac{1}{7}$$

Q-53 Total outcomes = 36

(i) 8 as sum

Possible outcomes = 5 [(2, 6), (3, 5), (4, 4), (5, 3), (6, 2)]

$$P = \frac{5}{36}$$

(ii) 6 as sum

Possible outcomes = 5 [(1, 5), (2, 4), (3, 3), (4, 2), (5, 1)]

$$P = \frac{5}{36}$$

(iii) 10 as sum

Possible outcomes = 3 [(4, 6), (5, 5), (6, 4)]

$$P = \frac{3}{36}$$

(iv) Same no. on both dice

Possible outcomes = 6 [(1, 1), (2, 2), (3, 3), (4, 4), (5, 5), (6, 6)]

$$P = \frac{1}{36} = \frac{1}{36}$$

(v) total more than 9

Possible outcomes = 6 [(4,6), (5,5), (6,4), (5,6), (6,5), (6,6)]

$$P = \frac{6}{36} = \frac{1}{6}$$

(vi) sum as 13

Impossible event as highest sum is 12.

(vii) sum less than or equal to 12

Possible outcomes = 36 (All outcomes)

$$P = \frac{36}{36} = 1$$

(viii) product less than 9

Possible outcomes = 16 [(1,1), (1,2), (1,3), (1,4), (1,5), (1,6), (2,1), (2,2), (2,3), (2,4), (3,1), (3,2), (4,1), (4,2), (5,1), (6,1)]

$$P = \frac{16}{36} = \frac{4}{9}$$

(ix) difference is 2

Possible outcomes = 8 [(1,3), (2,4), (3,1), (3,5), (4,2), (4,6), (5,3), (6,4)]

$$P = \frac{8}{36} = \frac{2}{9}$$

(x) product less than 16

Possible outcomes = 25 $[(1,1), (1,2), (1,3), (1,4), (1,5), (1,6), (2,1), (2,3), (2,4), (2,5), (2,6), (3,1), (3,2), (3,3), (3,4), (3,5), (4,1), (4,2), (4,3), (5,1), (5,2), (5,3), (6,1), (2,2), (6,2)]$

P =	25
	36

Q. 54 Total cards = $90 - 1 = 89$

(i) two digit no.

Outcomes of 1 digit no. = 8 (2, 3, 4, 5, 6, 7, 8, 9)

Possible outcomes = $89 - 8$

= 81

$$P = \frac{81}{89}$$

(ii) perfect square

Possible outcomes = 8 (4, 9, 16, 25, 36, 49, 64, 81)

$$P = \frac{8}{89}$$

Q. 55 Total outcomes = 36

Possible outcomes = 6 [(1, 1), (2, 2), (3, 3), (4, 4), (5, 5), (6, 6)]

$$P = \frac{6}{36} = \frac{1}{6}$$

Q. 56 Let the green marbles be x & the white marbles be y.

Yellow marbles = 10

Total marbles = $x + y + 10$

ATQ,

$$P(\text{green marble}) = \frac{1}{4}$$

$$\frac{x}{x + y + 10} = \frac{1}{4}$$

$$4x = x + y + 10$$

$$3x - y = 10 \quad \text{--- (1)}$$

$$P(\text{white marble}) = \frac{1}{3}$$

$$\frac{y}{x + y + 10} = \frac{1}{3}$$

$$3y = x + y + 10$$

$$-x + 2y = 10$$

$$x - 2y = -10 \quad \text{--- (2)}$$

Multiply (1) by (2)

$$\cancel{3x - y = 10} \quad 6x - 2y = 20 \quad \text{--- (3)}$$

Subtract (2) from (3)

$$6x - 2y = 20$$

$$x - 2y = -10$$

$$\begin{array}{r} (-) \quad (+) \quad (+) \\ \hline \end{array}$$

$$5x = 30$$

$$x = \frac{30}{5}$$

$$\boxed{x = 6}$$

Putting value of x in ①

$$3x - y = 10$$

$$3(6) - y = 10$$

$$18 - 10 = y$$

$$\boxed{y = 8}$$

$$\therefore \text{Green marbles} = \boxed{6}$$

$$\text{White marbles} = \boxed{8}$$

$$\begin{aligned} \text{Total marbles} &= 6 + 8 + 10 \\ &= \boxed{24} \end{aligned}$$

Q.60 Let the blue balls be x .

$$\text{Red balls} = 6$$

$$\text{Total balls} = 6 + x$$

ATQ,

$$\frac{2}{6+x} = 2 \left(\frac{6}{6+x} \right)$$

$$\frac{x}{6+x} = \frac{12}{6+x}$$

$$\cancel{6x} + x^2 = \cancel{72} + 12x$$

$$6+x(x) = 6+x(12)$$

$$\boxed{x = 12}$$

$$\therefore \text{No. of blue balls} = \boxed{12}$$

Q.61 Total cards = 52 - (K, Q, J of clubs)

$$= 52 - 3 = 49$$

(i) heart

$$P = \frac{13}{49}$$

(ii) queen

Possible outcomes = 3

$$P = \frac{3}{49}$$

(iii) clubs

Possible outcomes = 10

$$P = \frac{10}{49}$$

(iv) face card

Possible outcomes = $3 \times 3 = 9$

$$P = \frac{9}{49}$$

(v) queen of diamond

$$P = \frac{1}{49}$$

Q. 62 Total outcomes = 36

(i) 5 will not come either time

Outcomes in which 5 will come = 11 [(1, 5), (2, 5), (3, 5), (4, 5), (5, 5), (6, 5), (5, 1), (5, 2), (5, 3), (5, 4), (5, 6)]

~~P~~ Possible outcomes = $36 - 11$
= 25

$$P = \frac{25}{36}$$

(ii) 5 will come up atleast once

Possible outcomes = 11

$$P = \frac{11}{36}$$

(ii) 5 will come up at both dice

Possible outcome = 1 [(5, 5)]

$$P = \frac{1}{36}$$

Q.63 Total outcomes = 50

Favourable outcomes = 4 (12, 24, 36, 48)

$$P(\text{multiple of 3 \& 4}) = \frac{4}{50} = \frac{2}{25}$$

Q.64 Possible outcomes = 36

(i) 5 won't come either time

Possible outcomes = 25

$$P = \frac{25}{36}$$

(ii) 5 will come exactly once

Possible outcomes = 10 [(1, 5), (2, 5), (3, 5), (4, 5), (6, 5), (5, 1), (5, 2), (5, 3), (5, 4), (5, 6)]

$$P = \frac{10}{36} = \frac{5}{18}$$

Q.65 Total cards = 52 - 6 black face cards
= ~~52~~ 46

(i) Face card

Possible outcomes = 6

$$P = \frac{6}{46} = \frac{3}{23}$$

(ii) red card

Possible outcomes = 26

$$P = \frac{26}{46} = \frac{13}{23}$$

(iii) black card

Possible outcomes = 26 - 6

= 20

$$P = \frac{20}{46} = \frac{10}{23}$$

(iv) king

Possible outcomes = 2

$$P = \frac{2}{46} = \frac{1}{23}$$

Q.66

Total cards = 60 - 10

= 50

(i) odd no.

Possible outcomes = $\frac{50}{2} = 25$

$$P = \frac{25}{50} = \frac{1}{2}$$

(ii) perfect square

Possible outcomes = 4 (16, 25, 36, 49)

$$P = \frac{4}{25} = \frac{2}{25}$$

(iii) divisible by 5

Possible outcomes = $\frac{50}{10} = 10$

$$P = \frac{10}{50} = \frac{1}{5}$$

(iv) prime no. less than 20

Possible outcomes = 4 (11, 13, 17, 19)

$$P = \frac{4}{25} = \frac{2}{25}$$

Q.67 Total cards = 52 - (4 kings + 4 queens)
= 52 - 8 = 44

(i) red face card

Possible outcomes = 6 - (2 kings + 2 queens)
= 6 - 4 = 2

$$P = \frac{2}{44} = \frac{1}{22}$$

(ii) a black card

Possible outcomes = 26 - (2 kings + 2 queens)
= 26 - 4 = 22

$$P = \frac{22}{44} = \frac{1}{2}$$

Q.68 Total cards = $52 - 12$
 $= 40$

(i) a black face card
 Possible outcomes = 0
 $P = \frac{0}{40} = \boxed{0}$

(ii) a red card
 Possible outcomes = $26 - 6$ face cards
 $= 20$
 $P = \frac{20}{52} = \boxed{\frac{5}{13}}$

Q.69 Total cards = $52 - (2 + 2)$
 $= 52 - 4 = 48$

(i) a king
 $P = \frac{4}{48} = \boxed{\frac{1}{12}}$

(ii) a red colour
 Possible outcomes = $26 - 2$
 $= 24$

$P = \frac{24}{48} = \boxed{\frac{1}{2}}$

(iii) a face card
 Possible outcomes = $12 - 4$
 $= 8$

$P = \frac{8}{48} = \boxed{\frac{1}{6}}$

(iv) a queen

Possible outcomes = $4 - 2 = 2$

$$P = \frac{2}{44} = \frac{1}{22}$$

Q.70 Total cards = 44

No. of circles = 24

Blue circles = 9

Green circles = $24 - 9 = 15$

No. of squares = 20

Blue squares = 11

Green squares = $20 - 11 = 9$

(i) square

$$P = \frac{20}{44} = \frac{5}{11}$$

(ii) green colour

Possible outcomes = $15 + 9$
= 24

$$P = \frac{24}{44} = \frac{6}{11}$$

(iii) blue circles

$$P = \frac{9}{44}$$

(iv) green squares

$$P = \frac{9}{44}$$



Q.71 Total cards = 52 - 6 red face cards
 = 46

(i) a red card

Possible outcomes = 26 - 6
 = 20

$$P = \frac{20}{46} = \frac{10}{23}$$

(ii) a face card

Possible outcomes = 12 - 6
 = 6

$$P = \frac{6}{46} = \frac{3}{23}$$

(iii) a card of clubs

$$P = \frac{13}{46}$$