1. On a particular day, at a crossing in a city, the various types of 115 vehicles going past during a time-interval were observed as under:

Type of Vehicle	Three-wheeler	Four-wheeler	Two-wheeler
Frequency	25	30	60

Out of these vehicles, if one is choosen at random, what is the probability that the choosen vehicle is a 'Three-wheeler' ?

(i) $\dfrac{4}{23}$ (ii) $\dfrac{6}{23}$ (iii) $\dfrac{18}{23}$ (iv) $\dfrac{5}{23}$ (v) $\dfrac{1}{4}$

2. The following table shows the blood-groups of 324 students of a class.

Blood group	AB	O	B	A
Number of students	54	63	99	108

One student of the class is choosen at random. What is the probability that the choosen student has blood group 'A' ?

(i) $\dfrac{1}{2}$ (ii) $\dfrac{1}{3}$ (iii) 0 (iv) $\dfrac{2}{3}$

3. A bag contains 60 pink balls, 16 yellow balls, 36 white balls and 60 orange balls. One ball is drawn at random from the bag. Find the probability that the ball drawn is pink.

(i) $\dfrac{15}{43}$ (ii) $\dfrac{28}{43}$ (iii) $\dfrac{4}{11}$ (iv) $\dfrac{16}{43}$ (v) $\dfrac{14}{43}$

4. A box contains 16 yellow marbles, 56 red marbles, 60 black marbles and 12 blue marbles. One marble is drawn at random from the box. Find the probability that the marble drawn is not red.

(i) $\dfrac{11}{18}$ (ii) $\dfrac{2}{3}$ (iii) $\dfrac{12}{19}$ (iv) $\dfrac{7}{18}$ (v) $\dfrac{5}{9}$

5. A box contains 16 pink marbles, 56 yellow marbles, 48 orange marbles and 36 gray marbles. One marble is drawn at random from the box. Find the probability that the marble drawn is yellow or pink.

(i) $\dfrac{5}{13}$ (ii) $\dfrac{7}{13}$ (iii) $\dfrac{1}{2}$ (iv) $\dfrac{6}{13}$

6. A bag contains 14 yellow balls, 4 gray balls, 6 pink balls and 12 orange balls. One ball is drawn at random from the bag. Find the probability that the ball drawn is neither yellow nor orange.

(i) $\dfrac{13}{18}$ (ii) $\dfrac{5}{18}$ (iii) $\dfrac{2}{9}$ (iv) $\dfrac{1}{3}$ (v) $\dfrac{6}{19}$

7. What is the probability of a sure event?

(i) 0 (ii) $\dfrac{3}{4}$ (iii) $\dfrac{1}{4}$ (iv) $\dfrac{1}{2}$ (v) 1

8. What is the probability of an impossible event?

(i) $\dfrac{1}{4}$ (ii) 0 (iii) $\dfrac{1}{2}$ (iv) $\dfrac{3}{4}$ (v) 1

9. There are 58 students in a class room of whom 26 are boys and 32 are girls. From these students, one is choosen at random. What is the probability that the choosen student is a boy ?

(i) $\dfrac{7}{15}$ (ii) $\dfrac{16}{29}$ (iii) $\dfrac{14}{29}$ (iv) $\dfrac{13}{29}$ (v) $\dfrac{12}{29}$

10. There are 70 students in a class room of whom 38 are boys and 32 are girls. From these students, one is choosen at random. What is the probability that the choosen student is a girl ?

(i) $\dfrac{3}{7}$ (ii) $\dfrac{17}{35}$ (iii) $\dfrac{16}{35}$ (iv) $\dfrac{19}{35}$ (v) $\dfrac{17}{36}$

11. In a lottery, there are 11 prizes and 18 blanks. What is the probability of getting a prize?

(i) $\dfrac{2}{5}$ (ii) $\dfrac{11}{29}$ (iii) $\dfrac{12}{29}$ (iv) $\dfrac{10}{29}$ (v) $\dfrac{18}{29}$

12. In a lottery, there are 20 prizes and 15 blanks. What is the probability of not getting a prize?

(i) $\dfrac{1}{2}$ (ii) $\dfrac{4}{7}$ (iii) $\dfrac{3}{7}$ (iv) $\dfrac{2}{7}$

13. Which of the following are true?

a) The probability of an event that is very likely to happen is 1
b) Probability of getting 109 marks out of 100 is 1.09
c) If the probability is too less, it will become negative
d) The probability of an event that cannot happen is unknown
e) If the probability of failing the exam is 0.22, the probability of passing the exam is 0.78

(i) {b,e} (ii) {e} (iii) {a,e} (iv) {c,d,e}

14. Which of the following experiments have equally likely outcomes?

a) A ball is hit. It reaches the boundary or not
b) A baby is born. It is a boy or girl
c) A true/false question is attempted. The answer is either right or wrong
d) A man throws a die. The number on the top is either 3 or not 3
e) A man starts his vehicle. It starts or it does not starts

(i) {b,c} (ii) {d,c} (iii) {d,c,b} (iv) {a,b} (v) {e,a,b}

15. Which of the following are possible values of probability?

a) -2.5
b) $\dfrac{3}{4}$
c) 0.57
d) $\dfrac{9}{2}$
e) 2

(i) {d,c} (ii) {a,b} (iii) {d,c,b} (iv) {b,c} (v) {e,a,b}

16. If $P(E) = 0.5$, find $P(\bar{E})$

(i) 8.5 (ii) 0.5 (iii) 2.5 (iv) 7.5 (v) 1.5

17. Which of the following are true?

a) The probability of an impossible event is 1
b) For an event E, we have $0 \leq P(E) \leq 1$
c) The probability of an unsure event is 0
d) The probability of an imposible event can be > 1
e) The probability of a sure event is 1

(i) {b,e} (ii) {d,a,b} (iii) {a,b} (iv) {c,e} (v) {c,e,b}

18. Which of the following are true?

a) $P(E) + P(\bar{E}) = 0$
b) $P(E) - P(\bar{E}) = 0$
c) $P(E) - P(\text{not } E) = 0$
d) $P(E) = 1 - P(\bar{E})$
e) $P(E) + P(\text{not } E) = 1$

(i) {a,d} (ii) {b,e,d} (iii) {b,e} (iv) {c,a,d} (v) {d,e}

19. Two players Parvathi and Seema play a tennis match. It is known that the probability of Parvathi winning the match is 0.33. What is the probability of Seema winning the match?

(i) $\dfrac{33}{50}$ (ii) $\dfrac{67}{100}$ (iii) $\dfrac{17}{25}$ (iv) $\dfrac{33}{100}$ (v) $\dfrac{68}{101}$

20. A die is thrown 570 times. The number 3 appears on the upper face 112 times. Now the die is thrown at random. What is the probability of getting a 3 ?

(i) $\dfrac{57}{286}$ (ii) $\dfrac{56}{285}$ (iii) $\dfrac{1}{5}$ (iv) $\dfrac{229}{285}$ (v) $\dfrac{11}{57}$

21. 225 families with 2 children were selected randomly, and the following data were recorded

No. of girls in a family	0	1	2
Number of families	45	81	99

Compute the probability of the family, chosen at random, having no girls.

(i) 0 (ii) $\dfrac{2}{5}$ (iii) $\dfrac{4}{5}$ (iv) $\dfrac{1}{5}$ (v) $\dfrac{1}{3}$

22. Three coins are tossed simultaneously 185 times with the following frequencies of different outcomes :

Outcome	3 heads	2 heads	1 heads	No heads
Frequency	25	35	50	75

If the three coins are simultaneously tossed again, compute the probability of '2 heads' coming up.

(i) $\dfrac{4}{19}$ (ii) $\dfrac{30}{37}$ (iii) $\dfrac{7}{37}$ (iv) $\dfrac{8}{37}$ (v) $\dfrac{6}{37}$

23. A die is thrown 340 times with the frequencies for outcomes 1, 2, 3, 4, 5 and 6 as given in the following table

Outcome	1	2	3	4	5	6
Frequency	35	45	55	60	70	75

If the die is thrown again randomly, find the probability of getting 5 as outcome.

(i) $\dfrac{8}{35}$ (ii) $\dfrac{7}{34}$ (iii) $\dfrac{27}{34}$ (iv) $\dfrac{4}{17}$ (v) $\dfrac{3}{17}$

24. The distances (in km) of engineers from their residence to their place of work were found as follows

3 6 19 13 26 10 11 11 30 19

What is the empirical probability that an engineer lives less than 3 km from her place of work?

(i) 1 (ii) $\dfrac{3}{4}$ (iii) $\dfrac{1}{2}$ (iv) 0 (v) $\dfrac{1}{4}$

25. The distances (in km) of engineers from their residence to their place of work were found as follows

26 20 1 27 21 11 27 29 25 25

What is the empirical probability that an engineer lives greater than 27 km from her place of work?

(i) $\dfrac{2}{11}$ (ii) $\dfrac{1}{5}$ (iii) $\dfrac{1}{10}$ (iv) 0 (v) $\dfrac{9}{10}$

26. Simran and Savitha are friends. What is the probability that both will have different birthdays? (ignoring a leap year).

(i) $\dfrac{1}{365}$ (ii) $\dfrac{363}{365}$ (iii) $\dfrac{365}{366}$ (iv) 1 (v) $\dfrac{364}{365}$

27. Saraswathi and Bharathi are friends. What is the probability that both will have same birthdays? (ignoring a leap year).

(i) $\dfrac{2}{365}$ (ii) $\dfrac{1}{365}$ (iii) 0 (iv) $\dfrac{364}{365}$ (v) $\dfrac{1}{183}$

28. In a musical chair game, the person playing the music has been advised to stop playing the music at any time with in 2 minutes after she starts playing. What is the probabilty that the music will stop within the first half-minute after starting?

(i) $\dfrac{1}{4}$ (ii) $\dfrac{3}{4}$ (iii) $\dfrac{2}{5}$ (iv) 0 (v) $\dfrac{1}{2}$

29. A carton consist of 78 shirts of which 69 are good, 6 have minor defects and 3 have major defects. Hari, a trader, will only accept the shirts which are good, but Soundarya, another trader, will only reject the shirts which have major defects. One shirt is drawn at random from the carton. What is the probability that it is acceptable to Hari?

(i) $\dfrac{11}{13}$ (ii) $\dfrac{3}{26}$ (iii) $\dfrac{23}{26}$ (iv) $\dfrac{8}{9}$ (v) $\dfrac{12}{13}$

30. A carton consist of 81 shirts of which 67 are good, 13 have minor defects and 1 have major defects. Salman, a trader, will only accept the shirts which are good, but Deeksha, another trader, will only reject the shirts which have major defects. One shirt is drawn at random from the carton. What is the probability that it is acceptable to Deeksha?

(i) $\dfrac{80}{81}$ (ii) $\dfrac{79}{81}$ (iii) 1 (iv) $\dfrac{1}{81}$ (v) $\dfrac{81}{82}$

31. A lot of 30 bulbs contain 10 defective ones. One bulb is drawn at random from the lot. What is the probability that this bulb is defective ?

(i) $\dfrac{1}{3}$ (ii) $\dfrac{2}{3}$ (iii) 0 (iv) $\dfrac{1}{2}$

32. A lot of 32 bulbs contain 18 defective ones. One bulb is drawn at random from the lot. Suppose the bulb drawn is not defective and is not replaced. Now one bulb is drawn at random from the rest. What is the probability that this bulb is not defective ?

(i) $\dfrac{13}{31}$ (ii) $\dfrac{14}{31}$ (iii) $\dfrac{12}{31}$ (iv) $\dfrac{18}{31}$ (v) $\dfrac{7}{16}$

33. A box contains 70 discs which are numbered from 1 to 70. If one disc is drawn at random from the box, find the probability that it bears a two-digit number.

(i) $\dfrac{31}{35}$ (ii) $\dfrac{6}{7}$ (iii) $\dfrac{62}{71}$ (iv) $\dfrac{61}{70}$ (v) $\dfrac{9}{70}$

34. A box contains 90 discs which are numbered from 1 to 90. If one disc is drawn at random from the box, find the probability that it bears a perfect square number.

(i) $\dfrac{1}{10}$ (ii) $\dfrac{2}{11}$ (iii) $\dfrac{9}{10}$ (iv) $\dfrac{1}{5}$ (v) 0

35. A box contains 40 discs which are numbered from 1 to 40. If one disc is drawn at random from the box, find the probability that it bears a number divisible by 5.

(i) $\dfrac{2}{5}$ (ii) 0   (iii) $\dfrac{4}{5}$ (iv) $\dfrac{1}{5}$ (v) $\dfrac{1}{3}$

36. A game consists of tossing a coin 3 times and noting its outcome each time. Sai wins if all the tosses give the same result i.e., three heads or three tails, and loses otherwise. Calculate the probability that Sai will lose the game.

(i) $\dfrac{4}{5}$ (ii) $\dfrac{1}{2}$ (iii) $\dfrac{3}{4}$ (iv) $\dfrac{1}{4}$ (v) 1

37. 95 cards are numbered 1,2,3,....95 and put in a box and mixed thoroughly. A card is drawn at random. What is the probability that the number on the drawn card is an odd number?

(i) $\dfrac{49}{96}$ (ii) $\dfrac{47}{95}$ (iii) $\dfrac{49}{95}$ (iv) $\dfrac{48}{95}$

38. 53 cards are numbered 1,2,3,....53 and put in a box and mixed thoroughly. A card is drawn at random. What is the probability that the number on the drawn card is a prime number?

(i) $\dfrac{16}{53}$ (ii) $\dfrac{37}{53}$ (iii) $\dfrac{17}{54}$ (iv) $\dfrac{15}{53}$ (v) $\dfrac{17}{53}$

39. 62 cards are numbered 1,2,3,....62 and put in a box and mixed thoroughly. A card is drawn at random. What is the probability that the number on the drawn card is divisible by 5?

(i) $\dfrac{7}{31}$ (ii) $\dfrac{7}{32}$ (iii) $\dfrac{6}{31}$ (iv) $\dfrac{25}{31}$ (v) $\dfrac{5}{31}$

40. 72 cards are numbered 1,2,3,....72 and put in a box and mixed thoroughly. A card is drawn at random. What is the probability that the number on the drawn card is less then 29?

(i) $\dfrac{1}{3}$ (ii) $\dfrac{7}{18}$ (iii) $\dfrac{11}{18}$ (iv) $\dfrac{8}{19}$ (v) $\dfrac{4}{9}$

41. 94 cards are numbered 1,2,3,....94 and put in a box and mixed thoroughly. A card is drawn at random. What is the probability that the number on the drawn card is greater then 11?

(i) $\dfrac{41}{47}$ (ii) $\dfrac{83}{94}$ (iii) $\dfrac{84}{95}$ (iv) $\dfrac{11}{94}$ (v) $\dfrac{42}{47}$

42. Suppose a die is thrown on a rectangular region as shown below. What is the probability that it will land inside the circle of diameter 12.00 cm?

16.00 cm

22.00 cm
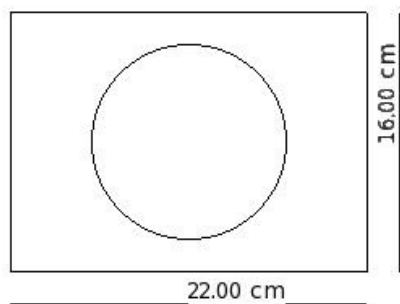
(i) $\dfrac{2}{7}$ (ii) $\dfrac{19}{28}$ (iii) $\dfrac{9}{28}$ (iv) $\dfrac{10}{29}$ (v) $\dfrac{5}{14}$

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43. A missing helicopter is reported to have crashed somewhere in the rectangular region shown in fig. What is the probability that it crashed inside the shaded region as shown in the figure?

31.00 m

10.5 m

21.00 m

23.25 m
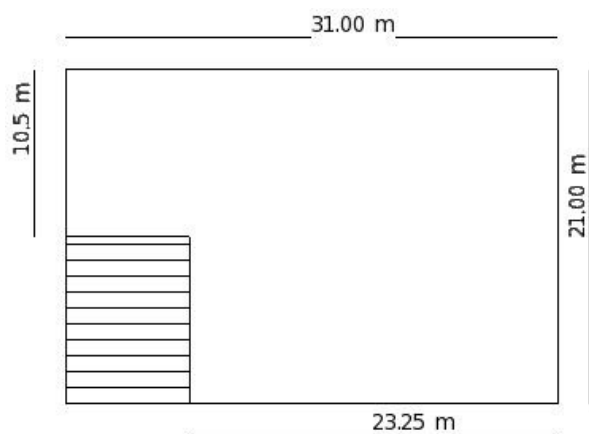
(i) $\dfrac{1}{4}$ (ii) $\dfrac{1}{8}$ (iii) $\dfrac{2}{9}$ (iv) 0 (v) $\dfrac{7}{8}$

Assignment Key

1) (iv)	2) (ii)	3) (i)	4) (i)	5) (iv)	6) (ii)
7) (v)	8) (ii)	9) (iv)	10) (iii)	11) (ii)	12) (iii)
13) (ii)	14) (i)	15) (iv)	16) (ii)	17) (i)	18) (v)
19) (ii)	20) (ii)	21) (iv)	22) (iii)	23) (ii)	24) (iv)
25) (iii)	26) (v)	27) (ii)	28) (i)	29) (iii)	30) (i)
31) (i)	32) (i)	33) (iv)	34) (i)	35) (iv)	36) (iii)
37) (iv)	38) (i)	39) (iii)	40) (ii)	41) (ii)	42) (iii)
43) (ii)					