



On a particular day, at a crossing in a city, the various types of 95 vehicles going past during a time-interval were observed as under:

1.

| Type of Vehicle | Three-wheeler | Two-wheeler | Four-wheeler |
|-----------------|---------------|-------------|--------------|
| Frequency       | 25            | 30          | 40           |

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

- (i)  $\frac{6}{19}$  (ii)  $\frac{13}{19}$  (iii)  $\frac{7}{19}$  (iv)  $\frac{7}{20}$  (v)  $\frac{5}{19}$

The following table shows the blood-groups of 261 students of a class.

2.

| Blood group        | A  | AB | O  | B  |
|--------------------|----|----|----|----|
| Number of students | 45 | 63 | 72 | 81 |

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

- (i)  $\frac{4}{15}$  (ii)  $\frac{22}{29}$  (iii)  $\frac{8}{29}$  (iv)  $\frac{6}{29}$  (v)  $\frac{7}{29}$

3. A box contains 36 pink marbles, 12 yellow marbles, 40 red marbles and 36 orange marbles. One marble is drawn at random from the box. Find the probability that the marble drawn is pink.

- (i)  $\frac{9}{31}$  (ii)  $\frac{5}{16}$  (iii)  $\frac{10}{31}$  (iv)  $\frac{8}{31}$  (v)  $\frac{22}{31}$

4. A bag contains 21 gray marbles, 42 white marbles, 30 yellow marbles and 36 orange marbles. One marble is drawn at random from the bag. Find the probability that the marble drawn is not gray.

- (i)  $\frac{7}{43}$  (ii)  $\frac{37}{43}$  (iii)  $\frac{35}{43}$  (iv)  $\frac{36}{43}$  (v)  $\frac{37}{44}$

5. A bag contains 10 orange marbles, 26 pink marbles, 12 red marbles and 28 black marbles. One marble is drawn at random from the bag. Find the probability that the marble drawn is black or orange.

- (i)  $\frac{2}{3}$  (ii)  $\frac{4}{5}$  (iii)  $\frac{3}{4}$  (iv)  $\frac{1}{2}$  (v)  $\frac{5}{6}$

6. A bag contains 70 black marbles, 35 blue marbles, 45 orange marbles and 65 red marbles. One marble is drawn at random from the bag. Find the probability that the marble drawn is neither black nor orange.

- (i)  $\frac{21}{44}$  (ii)  $\frac{23}{43}$  (iii)  $\frac{21}{43}$  (iv)  $\frac{20}{43}$  (v)  $\frac{19}{43}$

7. What is the probability of a sure event?

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

8. What is the probability of an impossible event?

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

9. There are 60 students in a class room of whom 26 are boys and 34 are girls. From these students, one is chosen at random. What is the probability that the chosen student is a boy ?

- (i)  $\frac{14}{31}$  (ii)  $\frac{2}{5}$  (iii)  $\frac{17}{30}$  (iv)  $\frac{13}{30}$  (v)  $\frac{7}{15}$

10. There are 74 students in a class room of whom 38 are boys and 36 are girls. From these students, one is chosen at random. What is the probability that the chosen student is a girl ?

- (i)  $\frac{17}{37}$  (ii)  $\frac{1}{2}$  (iii)  $\frac{19}{37}$  (iv)  $\frac{18}{37}$

11. In a lottery, there are 14 prizes and 17 blanks. What is the probability of getting a prize?

- (i)  $\frac{14}{31}$  (ii)  $\frac{17}{31}$  (iii)  $\frac{15}{32}$  (iv)  $\frac{13}{31}$  (v)  $\frac{15}{31}$

12. In a lottery, there are 16 prizes and 18 blanks. What is the probability of not getting a prize?

- (i)  $\frac{10}{17}$  (ii)  $\frac{8}{17}$  (iii)  $\frac{9}{17}$  (iv)  $\frac{5}{9}$

13. Which of the following are true?

- a) Probability of getting 109 marks out of 100 is 1.09
- b) If the probability of failing the exam is 0.8, the probability of passing the exam is 0.2
- c) The probability of an event that is very likely to happen is 1
- d) The probability of an event that cannot happen is unknown
- e) If the probability is too less, it will become negative

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

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

- a) A ball is hit. It reaches the boundary or not
- b) A true/false question is attempted. The answer is either right or wrong
- c) A baby is born. It is a boy or girl
- d) A man throws a die. The number on the top is either 5 or not 5
- e) A man starts his vehicle. It starts or it does not starts

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

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

- a)  $\frac{8}{7}$
- b) 0.38
- c)  $\frac{2}{3}$
- d) -4.5
- e) 4

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

16. If  $P(E) = 0.43$ , find  $P(\bar{E})$

- (i) 8.57 (ii) 0.57 (iii) 7.57 (iv) 1.57 (v) 2.57

17. Which of the following are true?

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

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

18. Which of the following are true?

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

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

19. Two players Sangeeta and Teena play a tennis match. It is known that the probability of Sangeeta winning the match is 0.57. What is the probability of Teena winning the match?

- (i)  $\frac{21}{50}$  (ii)  $\frac{11}{25}$  (iii)  $\frac{44}{101}$  (iv)  $\frac{43}{100}$  (v)  $\frac{57}{100}$

20. A die is thrown 480 times. The number 1 appears on the upper face 76 times. Now the die is thrown at random. What is the probability of getting a 1 ?

- (i)  $\frac{19}{120}$  (ii)  $\frac{3}{20}$  (iii)  $\frac{20}{121}$  (iv)  $\frac{1}{6}$  (v)  $\frac{101}{120}$

324 families with 2 children were selected randomly, and the following data were recorded

21.

|                                 |    |     |     |
|---------------------------------|----|-----|-----|
| <b>No. of girls in a family</b> | 0  | 1   | 2   |
| <b>Number of families</b>       | 90 | 108 | 126 |

Compute the probability of the family, chosen at random, having 2 girls.

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

Three coins are tossed simultaneously 180 times with the following frequencies of different outcomes :

22.

|                  |         |         |         |          |
|------------------|---------|---------|---------|----------|
| <b>Outcome</b>   | 3 heads | 2 heads | 1 heads | No heads |
| <b>Frequency</b> | 30      | 40      | 50      | 60       |

If the three coins are simultaneously tossed again, compute the probability of '3 heads' coming up.

- (i)  $\frac{2}{7}$  (ii) 0 (iii)  $\frac{1}{3}$  (iv)  $\frac{1}{6}$  (v)  $\frac{5}{6}$

A die is thrown 410 times with the frequencies for outcomes 1, 2, 3, 4, 5 and 6 as given in the following table

23.

|                  |    |    |    |    |    |     |
|------------------|----|----|----|----|----|-----|
| <b>Outcome</b>   | 1  | 2  | 3  | 4  | 5  | 6   |
| <b>Frequency</b> | 35 | 40 | 65 | 80 | 85 | 105 |

If the die is thrown again randomly, find the probability of getting 4 as outcome.

- (i)  $\frac{3}{14}$  (ii)  $\frac{8}{41}$  (iii)  $\frac{9}{41}$  (iv)  $\frac{7}{41}$  (v)  $\frac{33}{41}$

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

24. 16 4 14 10 27 2 6 10 3 17 7

What is the empirical probability that an engineer lives less than 17 km from her place of work?

- (i)  $\frac{10}{11}$  (ii)  $\frac{9}{11}$  (iii)  $\frac{2}{11}$  (iv)  $\frac{8}{11}$  (v)  $\frac{5}{6}$

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

25. 4 13 7 13 1 20 8 14 13 15 17 26 14

What is the empirical probability that an engineer lives greater than 26 km from her place of work?

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

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

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

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

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

In a musical chair game, the person playing the music has been advised to stop playing the music at any time

28. with in 2 minutes after she starts playing. What is the probability that the music will stop within the first half-minute after starting?

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

A carton consist of 75 shirts of which 64 are good, 10 have minor defects and 1 have major defects. Anthony, a trader, will only accept the shirts which are good, but Kajal, 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 Anthony?

29.

- (i)  $\frac{21}{25}$  (ii)  $\frac{11}{75}$  (iii)  $\frac{64}{75}$  (iv)  $\frac{13}{15}$  (v)  $\frac{65}{76}$

A carton consist of 82 shirts of which 67 are good, 13 have minor defects and 2 have major defects. Laxman, a trader, will only accept the shirts which are good, but Bhavani, 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 Bhavani?

30.

- (i)  $\frac{40}{41}$  (ii)  $\frac{41}{42}$  (iii)  $\frac{1}{41}$  (iv)  $\frac{39}{41}$  (v) 1

A lot of 34 bulbs contain 4 defective ones. One bulb is drawn at random from the lot. What is the probability that this bulb is defective ?

31.

- (i)  $\frac{2}{17}$  (ii)  $\frac{1}{6}$  (iii)  $\frac{15}{17}$  (iv)  $\frac{1}{17}$  (v)  $\frac{3}{17}$

A lot of 26 bulbs contain 14 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 ?

32.

- (i)  $\frac{14}{25}$  (ii)  $\frac{2}{5}$  (iii)  $\frac{11}{25}$  (iv)  $\frac{6}{13}$  (v)  $\frac{12}{25}$

33. 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 two-digit number.

- (i)  $\frac{9}{10}$  (ii)  $\frac{4}{5}$  (iii)  $\frac{10}{11}$  (iv)  $\frac{1}{10}$  (v) 1

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

35. A box contains 20 discs which are numbered from 1 to 20. If one disc is drawn at random from the box, find the probability that it bears a number divisible by 5.

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

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

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

37. 63 cards are numbered 1,2,3,...,63 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)  $\frac{31}{63}$  (ii)  $\frac{32}{63}$  (iii)  $\frac{33}{64}$  (iv)  $\frac{11}{21}$

38. 98 cards are numbered 1,2,3,...,98 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)  $\frac{26}{99}$  (ii)  $\frac{73}{98}$  (iii)  $\frac{13}{49}$  (iv)  $\frac{12}{49}$  (v)  $\frac{25}{98}$

39. 67 cards are numbered 1,2,3,...,67 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)  $\frac{12}{67}$  (ii)  $\frac{7}{34}$  (iii)  $\frac{54}{67}$  (iv)  $\frac{13}{67}$  (v)  $\frac{14}{67}$

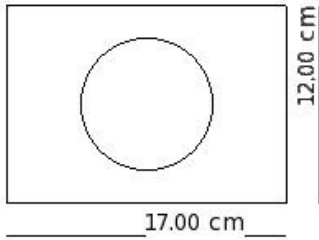
40. 60 cards are numbered 1,2,3,...,60 and put in a box and mixed thoroughly. A card is drawn at random. What is the probability that the number on the drawn card is less than 12?

- (i)  $\frac{49}{60}$  (ii)  $\frac{11}{60}$  (iii)  $\frac{12}{61}$  (iv)  $\frac{1}{5}$  (v)  $\frac{1}{6}$

41. 77 cards are numbered 1,2,3,...,77 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 than 19?

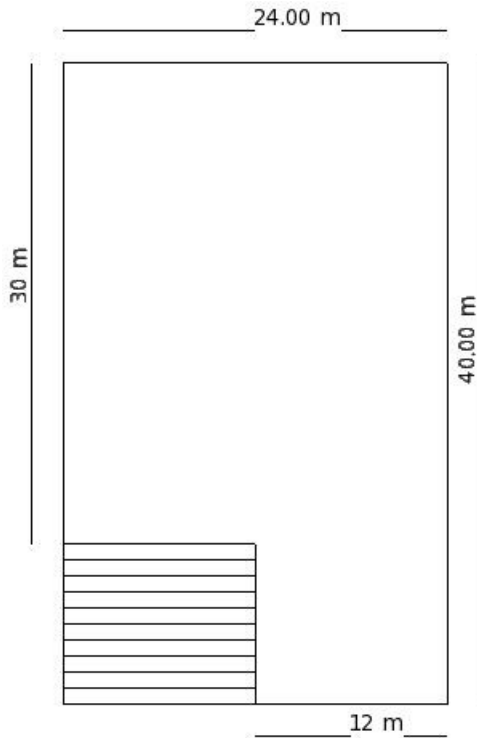
- (i)  $\frac{59}{78}$  (ii)  $\frac{19}{77}$  (iii)  $\frac{58}{77}$  (iv)  $\frac{57}{77}$  (v)  $\frac{59}{77}$

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 8.00 cm?



- (i)  $\frac{88}{357}$  (ii)  $\frac{89}{358}$  (iii)  $\frac{89}{357}$  (iv)  $\frac{29}{119}$  (v)  $\frac{269}{357}$

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?



- (i)  $\frac{7}{8}$  (ii)  $\frac{1}{8}$  (iii) 0 (iv)  $\frac{1}{4}$  (v)  $\frac{2}{9}$

## Assignment Key

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