MATHS

BOOKS - NAGEEN PRAKASHAN ENGLISH

PROBABILITY

Solved Examples

1. In any situation that has only two possible outcomes, each out come will have probability

$\dfrac{1}{2}$. Find whether it is true or false.

2. A marble is choosen at random from 6 marbles numbered 1 to 6. Find the probability of getting a marble having number 2 and 6 on it.

A. 1/2

B. 0

C. 1

D. None

Answer: B

3. A marble is chosen at random from 6 marbles numbered 1 to 6. Find the probability of getting a marble having number 2 or 6 on it.

4. A fair coin is tossed

(i) List the sample space.

(ii) What is p (head), the probability that a head will appear?

(iii) What is p (tail) ?

5. A fair die is tossed. List the sample space.

State the probability of the event :

(i) a number less than 3 appears

(ii) a number greater than 3 appears

(iii) a number greater than or equal to 3 appears

6. Two dice are thrown simultaneously. Find the probability of getting :

(i) an even number as the sum

(ii) an even number as the product

(iii) the sum as a prime number

(iv) a total of at least 10

(v) a doublet.

7. A die is thrown once. Find the probability of getting : (a) a prime number (b) (b) a number between 3 and 6 (c) a number greater than 4 (d) a number at most 4 (e) a factor of 6.

8. A standards deck of 52 cards is shuffled. Ritu draws a single card from the deck at random. What is the probability that the card is a jack ?

9. A bag contains 5 black, 7 red and 3 white balls. A ball is drawn from the bag at random. Find the probability that the ball drawn is :

(i) red (ii) black or white (iii) not black.

10. The probability of selecting a rotten apple randomly from a heap of 900 apples is 0·18.

What is the number of rotten apples in the heap ?

11. In a class, there are 18 girls and 16 boys. The class teacher wants to choose one for class monitor. What she does she writes the name of each on a card and puts them into a basket and mixes thoroughly? A child is asked to pick up one card from the basket. What is the probability that the name written on the card

is (i) the name of a girl? (ii) the name of a boy? (iii) the name of topper student of the class? (iv) not "Shiv Kumar" who is the son of Principal of this school?

12. One card is drawn from a well-shuffled deck of 52 cards. Find the probability of drawing :

(i) an ace (ii) '2' of spades (iii) '10' of a black suit.

13. Tickets are numbered from 10 to 60. A ticket is drawn at random. Find the probability that number drawn on the card is

(i) a ticket numbered from 22 to 38

(ii) a prime number

(iii) divisible by 3

(iv) divisible by 3 and 2 both .

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14. 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 (i) a two-digit number (ii) a perfect square number (iii) a number divisible by 5.

15. A game of chance consists of spinning an arrow which is equally likely to come to rest pointing to all of the numbers 1, 2, 3, ...,12.

What is the probability that it will point to (i) 10 (ii) an odd number (iii) a number which is multiple of 3?

16. Tickets numbered from 1 to 20 are mixed up together and then a ticket is drawn at random. What is the probability that the ticket has a number which is a multiple of 3 or 7?

17. A bag contains 15 white balls and some black balls. If the probability of drawing a black ball is thrice that of a white ball, find the number of black balls in the bag.

18. The king, queen and jack of clubs are removed from a deck of 52 playing cards and then well shuffled. One card is selected from the remaining cards. Find the probability of

getting i)a heart ii)a king iii)a club iv) the 10 of hearts

19. Find the probability of having 53 Tuesdays in a :

(i) non-leap year (ii) leap year.

20. From a pack of 52 cards, a black jack, a red queen and two black kings were removed. A card was then drawn from the remaining pack at random. Find the probability that the card drawn is :

(i) a black card (ii) a king (iii) a red queen.

21. It is know that a box of 600 electric bulbs contains 12 defective bulbs. One bulb is taken

out at random from this box. What is the probability that it is a non-defective bulb?

22. Two customers A and B are visiting a particular shop in the same week (Tuesday to Saturday). Each is equally likely to visit the shop on any day as on another day. What is the probability that both will visit the shop on: the same day?

23. Frorn a pack of 52 playing cards all cards whose numbers are multiples of 3 are removed. A card is now drawn at random. What is the probability that the card drawn is

(i) a face card (King, Jack or Queen) ?

(ii) an even numbered red card ?

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24. Two different dice are thrown simultaneously. What is the probability that

the sum of two number appearing on the top of dice is.

(i) 9 (ii) 10 (iii) at least 10 (iv) 13 (v) less than or equal 12

(vi) a multiple of 2 on one die and a multiple of 3 on the other die ?

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25. Find the probability of getting 52 Sundays in a leap year.

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26. If a number x is chosen at random from the number $-2, -1, 0, 1, 2.$ What is the probability that $x^2 < 2$?

27. A circle with radius 10 cm is drawn somewhere on a rectangular piece of paper of dimensions $40cm \times 30cm$. This paper is kept horizontally on table top and a point is marked on the rectangular paper without

seeing towards it. Find the probability that it will   marked   outside   the   circle. $\left(\text{Take } \pi = \dfrac{22}{7}\right)$

28. A square dart board is placed in the first quadrant from $x = 0$ to $x = 6$ and $y = 0$ to $y = 6$. A triangular region on the dart board is enclosed by the lines $y = 2, x = 6$ and $y = x.$ Find the probability that a dart that

randomly hits the dart board will land in the triangular region formed by the three lines.

29. Peter throws two different dice together and finds the product of the two numbers obtained. Rina throws a die and squares the number obtained. Who has the better chance to get the number 25?

1. A box contains 90 discs which are numbered from 1 to 90. If one discs is drawn at random from the box, find the probability that it bears (i) a two digit number (ii) a perfect square number (iii) a number divisible by 5.

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2. A child has die whose six faces show the letters as given below:

$$\boxed{A} \; \boxed{B} \; \boxed{C} \; \boxed{D} \; \boxed{E} \; \boxed{A}$$

The die is thrown once. What is the probability of getting (i) A, (ii) D?

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3. Suppose you drop a die at random on the rectangular region shown in Figure. What is the probability that it will land inside the circle with diameter 1m?

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4. A die is numbered in such a way that its faces show the numbers 1, 2, 2, 3, 3, 6. It is thrown two times and the total score in two throws is noted. Complete the following table which gives a few values of the total score on the two throws:What is the probability that the total score is(i) even? (ii) 6? (iii) at least 6?

5. Two dice are throw at the same time and the product of the numbers appearing on them is noted. Find the probability that the product is less than 9.

6. Two dice are numbered 1,2,3,4,5,6 and 1,1,2,2,3,3, resepectively. They are thrown and the sum of the number is noted. Find the

probability of getting each sum from 2 to 9, seperately.

7. A child's game has 8 triangles of which 3 are bule and rest are red and 10 square of which of 6 are bule and rest are red. One piece is lost a random. Find the probability that it is a :

(i) triagle

(ii) square

(iii) Square of bule colour

(iv) triangle of red colour.

8. In a game the entry fee is ₹5. The game consists of tossing coins 3 times. If one or two heads show, Sweta gets her entry fee back. If she throws 3 head, she receivers double entry fees. Otherwise she will lose. For tossing a coin three times, find the probability that she.

(i) loses the entry fee

(ii) gets double entey fee

(iii) just gets her entry fee.

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9. A bag contains 24 balls of which x are red, 2x are white and 3x are blue. A ball is selected at random. What is the probability that it is

(i) not red? (ii) white

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10. A lot consists of 48 mobile phones of which 42 are good, 3 have only minor defected and 3 have major defects. Varnika will buy a phone if its is good but the trader will only buy a mobile, if it has no major defect. One phone is selected at random from the lot. What is the probability that t is

(i) accetable to Varnika?

(ii) acceptable to the trader.

1. Find the probability of getting head in a toss of one coin:

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2. A bag contains a red ball, a blue ball and a yellow ball, all the balls being of the same size. Kritika takes out a ball from the bag without looking into it. What is the probability that

she takes out the (i) yellow ball? (ii) red ball? (iii) blue

3. A bag contains 3 white, 5 black and 2 red balls all of the same shape and size. A ball is drawn at random, find the probability that the ball drawn is :

(i) a black ball (ii) not a red ball.

4. Two coins are tossed simultaneously. Find the probability of getting:

(i) exactly 1 head (ii) at most 1 head (iii) at least 1 head.

5. Shalu buys a fish from a shop for her aquarium. The shopkeeper takes out one fish at random from a tank containing 5 male fish and 8 female fish. What is the probability that the fish taken out is a male fish?

6. In a single throw of a die, find the probability of getting a number :

(i) greater than 2 (ii) less than or equal to 2 (iii) not greater than 2.

7. A letter of English alphabet is chosen at random. Determine the probability that the

chosen letter is a consonant.

8. If the probability of Sayna winning a badminton match is 0.81, what is the probability of her losing the match?

9. Two friend were born in the same year, what is the probability that they have :

(i) same birthday (ii) different birthday.

10. In a single throw of a die find the probability that the number :

(i) will be an even number (ii) will not be an even number

(iii) will be an odd number.

11. It is known that a box of 200 electric bulbs contains 16 defective bulbs. One bulb is taken out at random from the box. What is the probability that the bulb drawn is (i) defective, (ii) non-defective?

12. (i) If A and B are two complementary events then what is the relation between P(A) and P(B) ?

13. 17 cards numbered 1, 2, 3,...., 17 are put in a box and mixed thoroughly. One person draws a card from the box. Find the probability that the number on the card is: odd (ii) a prime divisible by 3 (iv) divisible by 3 and 2 both

14. Which of the following cannot be the probability of an event :

(i) $\dfrac{3}{5}$ (ii) 2.7 (iii) 43% (iv) -0.6

(v) -3.2 (vi) 0.35 ?

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15. A bag contains 3 red balls and 5 black balls. A ball is drawn at random fret the bag. What is the probability that the ball drawn is (i) red? (ii) not red?

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16. In a family of 3 children the probability of having at least one boy is

17. A bag contains 6 red, 5 black and 4 white balls. A ball is drawn from the bag at random. Find the probability that the ball drawn is :

(i) white (ii) red (iii) not black (iv) red or white.

18. A book contains 85 pages. A page is chosen at random. What is the probability that the sum of the digits on the page is 8 ?

19. Which of the following cannot be the probability of an event : (A) $\dfrac{2}{3}$ (B) -1.5 (C) 15% (D) 0.7

20. Two dice are thrown at the same time. Write down the possible outcomes. Find the probability of getting the sum of two numbers appearing on the top of the dice as :

(i) 13 (ii) less than 13 (iii) 10 (iv) less than 10.

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21. In a musical chairs game, a person has been advised to stop playing the music at any time within 40 seconds after its start. What is the

probability that the music will stop within the first 15 seconds?

A. $\dfrac{3}{8}$

B. $\dfrac{2}{8}$

C. $\dfrac{3}{7}$

D. $\dfrac{1}{8}$

Answer: A

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22. The probability of selecting a red ball at random from a jar that contains only red, blue and orange balls is $\dfrac{1}{4}$ The probability of selecting a blue ball at random from the same jar is $\dfrac{1}{3}$ If the jar contains 10 orange balls, find the total number of balls in the jar.

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23. A bag contains 18 balls out of which x balls are red.

(i) If one ball is drawn at random from the bag what is the probability that it is not red?

(ii) If two more red balls are put in the bag, the probability of drawing a red ball will be $\dfrac{9}{8}$ times the probability of drawing a red ball in the first case. Find the value of x.

24. From a well shuffeled deck of 52 cards, one card is drawn. Find the probability that the card drawn is (i) a face card (ii) not a face card

(iii) a queen of black colour (iv) a card with nurnbcr 5 or 6 (v) a card with number less than 8 (vi) a card with number between 2 and 9.

25. All the three face cards of spades are removed from a well shuffled pack of 52 cards A card is then drawn at random from the remaining pack. Find the probability of getting

: (i) a black face card (ii) a queen (iii) a black card.

26. Find the probability that the month of January may have 5 Mondays in (i) a leap year (ii) a non-leap year.

27. Find the probability that the month of February may have 5 Wednesdays in (i) a leap year (ii) a non-leap year.

28. A jar contains 24 marbles, some are green and others are blue. If a marble is drawn at random from the jar, the probability that it is green is $\frac{2}{3}$. Find the number of blue balls in the jar.

29. Offices in Delhi are open for five days in a week (Monday to Friday). Two employees of an office remain absent for one day in the same particular week. Find the probability that they remain absent on :

(i) the same day

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1. A card is drawn from a pack of 100 cards numbered 1 to 100. Find the probability of drawing a number which is a square.

2. A die is thrown once. Find the probabilty of getting:

(i) an odd number (ii) a number between 2 and 6.

3. In a badminton match beteen Salin and Formcis the probability of wining of Salim is 0.58 . Find the prbabilitu of (i) not wining of Salim (ii) wining of Fromcis.

4. In a single throw of a die, find the probability of getting.

(i) a prime number

(ii) an even number

(iii) an even prime number

5. A card is drawn from a pack of 52 cards. Find

the probaility that the card drawn is

(i) a red card (ii) a black card .

(iii) ace of diamonf (iv) a queen or a jack.

6. In a bundle of 50 shirts, 44 are good, 4 have minor defects and 2 have major defects. What is the probability that :

(i) it is acceptable to a trader who accepts only a good shirt .

(ii) it is acceptable to a trader who reject only a shirt with major defects ?

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7. If P(E) = 0.34, find p(not E).

8. A bag contains 100 identical marble stones which are numbered form 1 to 100. If one stone is a drawn at random from the bag, find the probability that it bears (i) a number divisible by 4 or 5 ,(ii) a number divisible by 4 and 5.

9. A game consists fo spining an arrow which come to rest pointing at one of the number 1,2,3,4,5,6,7,8,9, 10,11,12. Find the probability that the point at (i) a prime number, (ii) a number less than or equal to 9, (iii) a number between 3 and 11.

10. Two dice are throw simultaneously . Find the probability that (i) both dice show the

same number, (ii) the product of the numbers on the dice is 8, (iii) the total of the numbers on the dice is greater than 9.

11. A book contains 32 pages. A page is chosen at random. What is the probability that the sum of the digits on the page is :

(i) divisible by 2

(ii) divisible by 3.

(iii) divisible by 5

(iv) divisible by 2 or 3 or 5

(v) divisible by 2, 3 and 5 ?

12. Write the probability of an impossible event.

13. Write the probability of a surve event.

14. Can it be the probability of any event as $\dfrac{5}{3}$?

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15. A bag contains red, white, blue balls. Write the sum of P (red), P (white) and P (blue) balls.

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16. A bag constains white, black and red ball only. A ball is draw at random form the bage. If the probability of getting a white balls is $\dfrac{3}{10}$ and that of a black ball is $\dfrac{2}{5}$ then find the probability of getting a red ball. If the bag contains 20 black balls, find the total number of balls in the bag.