14. Probability - Board Exam Questions

The detailed solution for all the questions can be found at
pschool.in/math/ncert/g10/chap-14

1 Mark Questions (MCQ)

1) A die is thrown once. Probability of getting a number other than 3 is:
2) The probability for a randomly selected number out of 1, 2, 3, 4, ..., 25 to be a composite number is:
3) Two dice are rolled together. The probability that the sum of the numbers obtained is divisible by 6, is:
4) Two different dice are rolled together. The probability that both the obtained numbers are less than 4, is
5) Which of the following can not be the probability of an event?
   (a) $\frac{39}{100}$ (b) $\frac{0.001}{20}$
   (c) $\frac{10}{0.2}$ (d) 10%
6) A card is drawn at random from a well shuffled deck of 52 playing cards. The probability that it is either a ten or a king is
7) Meena calculates that the probability of her winning the first prize in a lottery is 0.08. If total 800 tickets were sold, the number of tickets bought by her, is
8) T-shirts marked with numbers 4 to 99 are placed in a box. Gunika is fond of numbers. She randomly takes out a T-shirt from this box. The probability that she gets a T-shirt marked with a number that is either a perfect square or a perfect cube is:
9) Two dice are rolled simultaneously. The probability of getting number less than 4 on each die is:
10) 2 cards of diamonds and 4 cards of spades are missing from a pack of 52 cards. A card is drawn at random from this pack. The probability of getting a card of heart is:
11) A card is selected at random from a deck of 52 playing cards. The probability of it being a red face card is:
12) The probability of drawing an even prime number out of numbers from 1 to 30 is:
13) In a cricket match, a batsman hits the boundary 7 times out of the 42 balls he plays. The probability of his not hitting a boundary is:

14) A die is thrown once. The probability of getting a number which is not a factor of 36, is:

15) The number of red balls in a bag is 10 more than the number of black balls. If the probability of drawing a red ball at random from this bag is $\frac{3}{5}$, then the total number of balls in the bag is:

16) A pair of dice is thrown. The probability that sum of numbers appearing on top faces is at most 10 is:

17) A bag contains red balls and black balls in the ratio 3 : 7. A ball is drawn at random. The probability that ball so drawn is black in colour, is

18) The probability of getting a composite number greater than 3 on throwing a die is

19) Two coins are tossed simultaneously. The probability of getting atleast one head is

20) A pair of dice is tossed. The probability of not getting the sum eight is

21) If the probability of the letter chosen at random from the letters of the word "Mathematics" to be a vowel is $\frac{2}{2x+1}$, then x is equal to

22) If the probability of a player winning a game is 0.79, then the probability of his losing the same game is:

23) From the data 1, 4, 7, 9, 16, 21, 25, if all the even numbers are removed, then the probability of getting at random a prime number from the remaining is:

24) Two dice are rolled together. The probability of getting sum of numbers on the two dice as 2, 3 or 5, is:

25) Two dice are rolled together. The probability of getting the sum of the two numbers to be more than 10, is

26) A box contains cards numbered 6 to 55. A card is drawn at random from the box. The probability that the drawn card has a number which is a perfect square, is

27) Two dice are thrown together. The probability that they show different numbers is:

28) The probability of guessing the correct answer to a certain test question is $\frac{x}{6}$. If the probability of not guessing the correct answer to this question is $\frac{2}{3}$, then the value of x is:

29) If a digit is chosen at random from the digits 1, 2, 3, 4, 5, 6, 7, 8, 9; then the probability that this digit is an odd prime number is:

30) Two dice are tossed simultaneously. The probability of getting odd numbers on both the dice is:

31) For an event E, if $P(E) + P(\bar{E}) = q$, then the value of $q^2 - 4$ is:

32) One ticket is drawn at random from a bag containing tickets numbered 1 to 40. The probability that the selected ticket has a number which is a multiple of 7 is:

33) In a bag containing 24 balls, 4 are blue, 11 are green and the rest are white. One ball is drawn at random. The probability that drawn ball is white in colour is

34) Probability of happening of an event is denoted by p and probability of non-happening of the event is denoted by q. Relation between p and q is

35) A girl calculates that the probability of her winning the first prize in a lottery is 0.08. If 6000 tickets are sold, how many tickets has she bought?

36) In a group of 20 people, 5 can't swim. If one person is selected at random, then the probability that he/she can swim, is

37) A bag contains 100 cards numbered 1 to 100. A card is drawn at random from the bag. What is the probability that the number on the card is a perfect cube?

38) If three coins are tossed simultaneously, what is the probability of getting at most one tail?

39) Two dice are thrown together. The probability of getting the difference of numbers on their upper faces equals to 3 is:

40) A card is drawn at random from a well-shuffled pack of 52 cards. The probability that the card drawn is not an ace is:

41) Two coins are tossed together. The probability of getting at least one tail is:

42) Which of the following numbers cannot be the probability of happening of an event?

(a) 0 (b) $\frac{7}{0.01}$

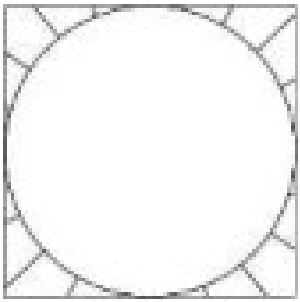
(c) 0.07 (d) $\frac{0.07}{3}$

43) A bag contains 5 pink, 8 blue and 7 yellow balls. One ball is drawn at random from the bag. What is the probability of getting neither a blue

nor a pink ball?

44) A card is drawn at random from a well shuffled deck of 52 playing cards. The probability of getting a face card is

45) There is a square board of side '$2a$' units circumscribing a red circle. Jayadev is asked to keep a dot on the above said board. The probability that he keeps the dot on the shaded region is



46) 2 cards of hearts and 4 cards of spades are missing from a pack of 52 cards. A card is drawn at random from the remaining pack. What is the probability of getting a black card?

47) Two dice are rolled simultaneously. What is the probability that 6 will come up at least once?

Assertion and Reason

1) ASSERTION (A): The probability that a leap year has 53 Mondays is $\frac{2}{7}$.
REASON (R): The probability that a non-leap year has 53 Mondays is $\frac{5}{7}$.

2) ASSERTION (A): If probability of happening of an event is 0.2p, p > 0, then p can't be more than 5.
REASON (R): $P(\bar{E}) = 1 - P(E)$ for an event E.

3) ASSERTION (A): The probability of selecting a number at random from the numbers 1 to 20 is 1.
REASON (R): For any event E, if P(E) = 1, then E is called a sure event.

4) ASSERTION (A): Event E_1: getting a number less than 3 and Event E_2: getting a number greater than 3 are complementary events.
REASON (R): If two events E and F are complementary events, then P(E) + P(F) = 1.

5) ASSERTION (A): In a cricket match, a batsman hits a boundary 9 times out of 45 balls he plays. The probability that in a given ball, he does not hit the boundary is $\frac{4}{5}$.
REASON (R): P(E) + P(not E) = 1

2 Mark Questions

1) A bag contains 4 red, 3 blue and 2 yellow balls. One ball is drawn at random from the bag. Find the probability that drawn ball is (i) red (ii) yellow.

2) A bag contains 25 balls. Some of them are yellow and others are green. One ball is drawn at random. If probability of getting a green ball is 3/5, then find the number of yellow balls.

3) The number of red balls in a bag is three more than the number of black balls. If the probability of drawing a red ball at random from the given bag is $\frac{12}{23}$, find the total number of balls in the given bag.

4) A carton consists of 60 shirts of which 48 are good, 8 have major defects and 4 have minor defects. Nigam, a trader, will accept the shirts which are good but Anmol, another trader, will only reject the shirts which have major defects. One shirt is drawn at random from the carton. Find the probability that it is acceptable to Anmol.

5) One card is drawn at random from a well shuffled deck of 52 cards. Find the probability that the card drawn (i) is queen of hearts; (ii) is not a jack.

6) While shuffling a pack of 52 cards, one card was accidently dropped. Find the probability that the dropped card (i) is not a face card. (ii) is a black king.

7) In a pack of 52 playing cards one card is lost. From the remaining cards, a card is drawn at random. Find the probability that the drawn card is queen of heart, if the lost card is a black card.

8) If a fair coin is tossed twice, find the probability of getting 'atmost one head'.

9) Two dice are thrown simultaneously. Find the probability that the product of the numbers appearing on them is a prime number.

10) Two dice are rolled together bearing numbers 4, 6, 7, 9, 11, 12. Find the probability that the product of numbers obtained is an odd number.

11) The probability of guessing the correct answer of a certain test question is $\frac{x}{12}$. If the probability of not guessing the correct answer is $\frac{5}{6}$, then find the value of x.

12) Two friends Anil and Ashraf were born in the December month in the year 2010. Find the probability that: (i) they share same date of birth. (ii) they have different dates of birth.

13) How many positive three digit integers have the hundreds digit 8 and unit's digit 5? Find the probability of selecting one such number out of all three digit numbers.

3 Mark Questions

1) Two coins are tossed simultaneously. What is the probability of getting
(i) at least one head?
(ii) at most one tail?
(iii) a head and a tail?

2) Three unbiased coins are tossed simultaneously. Find the probability of getting: (a) exactly two tails (b) at least one head (c) at most two heads

3) Three coins are tossed simultaneously. What is the probability of getting (i) at least one head? (ii) exactly two tails? (iii) at most one tail?

4) Three unbiased coins are tossed simultaneously. Find the probability of getting: (i) at least one head. (ii) exactly one tail. (iii) two heads and one tail.

5) On a particular day, Vidhi and Unnati couldn't decide on who would get to drive the car. They had one coin each and flipped their coin exactly three times. The following was agreed upon:
1. If Vidhi gets two heads in a row, she would drive the car.
2. If Unnati gets a head immediately followed by a tail, she would drive the car.
Who has greater probability to drive the car that day? Justify your answer.

6) Two dice of different colours are thrown at the same time. Write down all the possible outcomes. What is the probability that: (i) same number appears on both the dice? (ii) different number appears on both the dice?

7) Two dice are thrown at the same time. Determine the probability that the (i) sum of the numbers on the two dice is 5, and (ii) difference of the numbers on the two dice is 3.

8) Two dice are thrown at the same time. Determine the probability that the difference of the numbers on the two dice is 2.

9) A bag contains 30 balls out of which 'm' number of balls are blue in colour. (i) Find the probability that a ball drawn at random from the bag is not blue. (ii) If 6 more blue balls are added in the bag, then the probability of drawing a blue ball will be $\frac{5}{4}$ times the probability of

drawing a blue ball in the first case. Find the value of m.

10) A box contains 90 discs which are numbered 1 to 90. If one disc is drawn at random from the box, find the probability that it bears a: (i) 2-digit number less than 40. (ii) number divisible by 5 and greater than 50. (iii) a perfect square number.

4 Mark Questions

1) "Eight Ball" is a game played on a pool table with 15 balls numbered 1 to 15 and a "cue ball" that is solid and white. Of the 15 numbered balls, eight are solid (non-white) coloured and numbered 1 to 8 and seven are striped balls numbered 9 to 15.
The 15 numbered pool balls (no cue ball) are placed in a large bowl and mixed, then one ball is drawn out at random.
(i) What is the probability that the drawn ball bears number 8? (1)
(ii) What is the probability that the drawn ball bears an even number? (2)
OR What is the probability that the drawn ball bears a number, which is a multiple of 3?
(iii) What is the probability that the drawn ball is a solid coloured and bears an even number? (1)

2) Computer-based learning (CBL) refers to any teaching methodology that makes use of computers for information transmission. At an elementary school level, computer applications can be used to display multimedia lesson plans. A survey was done on 1000 elementary and secondary schools of Assam and they were classified by the number of computers they had.

Number of Computers	1–10	11–20	21–50	51–100	101 and more
Number of Schools	250	200	290	180	80

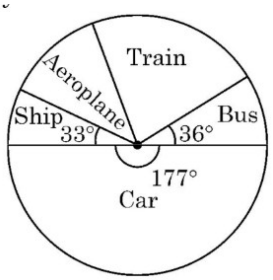
One school is chosen at random. Then:
(i) Find the probability that the school chosen at random has more than 100 computers. (1)
(ii) (a) Find the probability that the school chosen at random has 50 or fewer computers. (2)
OR (b) Find the probability that the school chosen at random has no more than 20 computers.
(iii) Find the probability that the school chosen at random has 10 or less than 10 computers. (1)

3) Rahul is a lucky charm for his cricket team. He has a jar of cards with

numbers from 10 to 74. Before each match, he draws a card from the jar. If the card bears an even number, the team wins. If the number is even and divisible by 5, they win by a big margin. If the number is an odd number less than 30, they win by a small margin. And if the number is a prime number between 50 and 74, they lose.
Answer the following questions if Rahul draws a card today:
(i) What is the probability that Rahul draws a card with an even number? (1)
(ii) What is the probability that Rahul draws a card with an odd number less than 30? (1)
(iii) (a) What is the probability that Rahul draws a card with a prime number between 50 and 74? (2)
OR (b) What is the probability that Rahul draws a card with an even number divisible by 5?

4) A group of friends wanted to play cards with two identical packs together. While shuffling the cards, three cards are dropped. Rest of the cards are shuffled and one card is drawn at random. Assuming that the dropped cards were a queen of hearts, a ten of spades and an ace of clubs, answer the following questions:
(i) Find the probability that the drawn card is a face card. (1)
(ii) Find the probability that the drawn card is either a king or a queen. (1)
(iii) (a) Do you think that the probability of getting a queen was higher if none of the cards were dropped? Justify your answer. (2)
OR (b) Find the probability that the drawn card is a jack. Compare it with the probability when none of the cards were dropped. In which case is the probability of getting a jack higher?

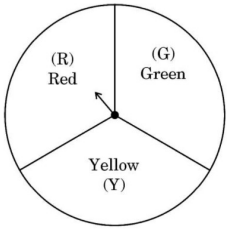
5) In a survey on holidays, 120 people were asked to state which type of transport they used on their last holiday. The following pie chart shows the results of the survey.



(i) If one person is selected at random, find the probability that he/she travelled by bus or ship. (1)
(ii) Which is most favourite mode of transport and how many
people used it? (1)
(iii) (a) A person is selected at random. If the probability that he did not use train is 4/5, find the number of people who used train. (2)
OR (b) The probability that randomly selected person used aeroplane

is 7/60. Find the revenue collected by air company at the rate of ₹5,000 per person.

6) A middle school decided to run the following spinner game as a fund-raiser on Christmas Carnival.
Making Purple: Spin each spinner once. Blue and red make purple. So, if one spinner shows Red (R) and another Blue (B), then you 'win'. One such outcome is written as 'RB'.



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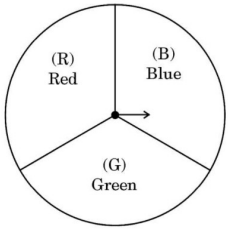

II

(i) List all possible outcomes of the game. (1)
(ii) Find the probability of 'Making Purple'. (1)
(iii) (a) For each win, a participant gets ₹10, but if he/she loses, he/she has to pay ₹5 to the school. If 99 participants played, calculate how much fund could the school have collected. (2)
OR (b) If the same amount of ₹5 has been decided for winning or losing the game, then how much fund had been collected by school? (Number of participants = 99)