MATHS

BOOKS - CENGAGE

STATISTICS AND PROBABILITY

Worked Examples

1. An unbiased coin is tossed once. What is the probability of getting a head?

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2. An unbiased die is rolled once. What is the probability of getting a 4?

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3. In a cricket match, a batsman hits five boundaries in 20 balls. What is the probability that he does not hit a boundary?

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4. The percentage marks scored by a student in five unit tests are given in the following table. What is the probability that he scores more than 80% in any unit test?

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Test Yourself Level 1

1. Find the mean of the ungrouped data: 3, 3, 7, 2, 2, 5, 3, 3, 7, 1.

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2. Find the median of 12, 10, 13, 20, 8, 18, 9, 15, 6, 20.

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3. What is the mode of the data: 4, 7, 6, 4, 1, 4, 7, 6, 4, 1?

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4. A box contains three green balls, five yellow balls, and seven white balls. If a ball is taken out at random, what is the probability that it is green?

A. $\frac{2}{5}$

B. $\frac{3}{4}$

C. $\frac{1}{4}$

D. $\frac{1}{5}$

Answer: D

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5. There are cards on which the letters A, B, C, ..., Z are printed. If a card is chosen at random, what is the chance that it has the letter S?

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Test Yourself Level 2

1. Find the median of the data: 155, 160, 145, 149, 150, 147, 152, 144, 148.

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2. Find the mode of the data: 4, 6, 5, 9, 3, 2, 7, 7, 6, 5, 4, 9, 10, 10, 3, 4, 7, 9, 9.

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3. For the above distribution in Q.12, find the mean.

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4. Find the median of the following data:

26, 17, 27, 17, 33, 32, 20, 29, and 36.

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5. Find the median of the following data:

242, 244, 148, 351, 328, 300, 262, 293, 272, 259, and 258.

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6. Find the median of the following data:

64, 18, 51, 10, 26, 44, 22, 51, and 35.

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7. Find the mode of the following:

42, 40, 49, 53, 47, 63, 55, 41, 97, 53, 99, 41, 43, 53, 61.

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8. Find the mode of the following:

The following observations have been arranged in ascending order. If the mean of the data is 64, find the value of x

30, 33, 49, 51, x, x+3, 73, 79, 85, 96.

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9. In a survey of families, chosen randomly, it was found that 375 families had two girls, 514 families had only one girl, and 111 had no girl.

If a family is selected at random, what is the probability that it has two girls?

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Test Yourself Level 3

1. Calculate the mean, median, and mode for the following data:

2000, 1800, 3000, 500, 3500, 2200

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Test Yourself Mcq

1. The mean of the ungrouped data 2, 2, 2, 2, 2 is

A. 5

B. 4

C. 3

D. 2

Answer: D

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2. If the mean of data x, 4, 6, 8, 10 is 6 then value of x is

A. 1

B. 2

C. 6

D. 8

Answer: B

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3. The mean of data $a-3d, a-2d, a-d, a, a-d, a+2d, a+3d$ is

A. 2a

B. $a+d$

C. a

D. $2a+2d$

Answer: C

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4. If the mean of first n even natural numbers is n itself then n is

A. 100

B. 2000

C. 80000

D. not possible

Answer: D

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5. If the mean of first n odd natural numbers is n itself

A. 3

B. 7

C. 9

D. any natural number

Answer: D

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6. If mean of first three terms is 12 and mean of last two terms is 4.5 then find mean of all 5 terms.

A. 6

B. 7

C. 8

D. 9

Answer: D

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7. A group of 12 items has mean 5. If mean of 5 of these items is 3.6 then mean of remaining items is

A. 5

B. 6

C. 8

D. 10

Answer: B

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8. If a car goes from A to B at a speed of x km/hr and returns from B to A with a speed of y km/hr. Then the average speed is

A. $\frac{x+y}{2} km/h$

B. $\frac{xy}{x+y} km/h$

C. $\frac{2xy}{x+y} km/h$

D. $(x+y) km/h$

Answer: C

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9. The median of first 25 odd natural numbers is

A. 21

B. 25

C. 35

D. 27

Answer: B

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10. Following table represents the marks in a subject of students of a class.

Marks	10	20	30	33	40	45
Number of students	2	4	8	10	2	3

Mode of above distribution is

A. 48

B. 33

C. 30

D. 10

Answer: B

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11. If the difference between mean and mode of a data is 21, then difference between mean and median is

A. 63

B. 7

C. 33

D. 21

Answer: B

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12. The mean of 5 items of a data has been wrongly calculated as 30 because a value 30 was wrongly taken as 20. The correct mean should be

A. 30

B. 28

C. 32

D. 34

Answer: C

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13. If $ab + bc + ca = 0$ and mean of a^2, b^2, c^2 is 27 then mean of a, b, c is

A. 9

B. 81

C. 3

D. 6

Answer: C

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14. If $a+b+c=0$ and $abc=9$ then mean of a^3, b^3, c^3 is

A. 9

B. 729

C. 3

D. 27

Answer: A

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15. If the mean and median of a set of numbers are 8.2 and 8.4, respectively, then mode is

A. 7.7

B. 7.6

C. 8.8

D. 7.8

Answer: D

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16. The first quartile for data 5, 7, 4, 4, 6, 7, 2 is

A. 4

B. 2

C. 5

D. 6

Answer: A

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17. In an ungrouped data if Q_1, Q_2 and Q_3 are first, second and third quartiles, respectively, then quartile deviation is

A. $Q_3 - Q_1$

B. $\frac{Q_3 - Q_1}{2}$

C. $Q_2 - Q_1$

D. $\frac{Q_2 - Q_1}{2}$

Answer: B

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18. If $\bar{x}$ is the mean of $x_1, x_2, \ldots, x_n$ then the value of $\sum_{i=1}^{n} (x_i - \bar{x})$ is

A. 0

B. $2\bar{x}$

C. $\bar{x}$

D. $\frac{\bar{x}}{2}$

Answer: A

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19. If the first 10 elements of a set are replaced by $(x_i - 10)$, where $i = 1, 2, 3, \ldots, 10$, and the next 10 elements are replaced by $(x_i + 10)$, where I = 11, 12, 13,....,20, then mean will change by

A. 50

B. 100

C. 25

D. 0

Answer: D

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20. If the difference between mean and mode is x and that of mean and median is y, then the correct relation is

A. $x = 3y$

B. $y = 3x$

C. $2x = 3y$

D. $3x = 2y$

Answer: A

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21. Probability of getting head in a biased coin is 2/3. If the coin is tossed again, then what is the probability that it will show tail?

A. $\frac{1}{3}$

B. $\frac{2}{3}$

C. $\frac{1}{2}$

D. 1

Answer: A

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22. Two coins are tossed simultaneously. What is the probability of getting at most two heads?

A. 1

B. $\frac{1}{2}$

C. $\frac{2}{3}$

D. $\frac{1}{12}$

Answer: A

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23. If two dice are thrown, then the probability of getting same number on either dice is

A. $\frac{1}{6}$

B. $\frac{1}{3}$

C. $\frac{2}{9}$

D. $\frac{1}{12}$

Answer: A

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24. Two dice are thrown, and numbers shown on each dice is noted. What is the probability that sum of number is 9?

A. $\frac{1}{6}$

B. $\frac{1}{3}$

C. $\frac{1}{9}$

D. $\frac{2}{9}$

Answer: C

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25. If three unbiased coins are tossed, then probability of getting at most two tails is

A. $\frac{1}{8}$

B. $\frac{1}{2}$

C. $\frac{5}{8}$

D. $\frac{7}{8}$

Answer: D

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26. A letter is chosen at random from the word COFFEE . The probability of that letter being vowel is

A. $\frac{1}{6}$

B. $\frac{1}{3}$

C. $\frac{1}{2}$

D. $\frac{2}{3}$

Answer: C

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27. From a pack of 52 cards, one card is drawn at random. The probability of getting a red card is

A. $\frac{1}{4}$

B. $\frac{1}{2}$

C. $\frac{3}{4}$

D. none of these

Answer: B

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28. From a pack of 52 cards, a card is drawn at random. The probability of getting a club is

A. $\frac{1}{2}$

B. $\frac{1}{4}$

C. $\frac{2}{3}$

D. $\frac{1}{13}$

Answer: B

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29. From a pack of 52 cards, a card is selected at random. The probability of getting either black or an ace is

A. $\frac{3}{13}$

B. $\frac{4}{13}$

C. $\frac{5}{13}$

D. $\frac{7}{13}$

Answer: B

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30. When two dice are thrown simultaneously, then what is the probability that there is exactly one 6?

A. $\frac{1}{9}$

B. $\frac{1}{6}$

C. $\frac{6}{23}$

D. $\frac{2}{9}$

Answer: B

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31. When three identical dice are rolled, then what is the probability of getting same number on each dice?

A. $\frac{1}{6}$

B. $\frac{1}{2}$

C. $\frac{1}{216}$

D. $\frac{1}{36}$

Answer: D

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32. A box contains 20 balls numbered as 1, 2, 3, ..., 20. A ball is drawn at random from the box. What is the probability that the number on the ball is a prime number?

A. $\frac{1}{5}$

B. $\frac{3}{5}$

C. $\frac{4}{5}$

D. $\frac{2}{5}$

Answer: D

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Olympiad And Ntse Level Exercises

1. The mean of $x_1 + x_2 + \ldots + x_n$ is M. When $x_i, i = 1, 2, \ldots, 10,$ is replaced by $x_i + 10,$ the mean is M_1. Then M_1 =

A. M

B. $M + 10$

C. 10 M

D. $M + 100$

Answer: B

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2. The weights in kilogram of 9 members in a school boxing team are 54, 59, x, 53, 73, 49, 50, 58, 45. If the average is 56, then x is

A. 61 kg

B. 62 kg

C. 64 kg

D. 63 kg

Answer: D

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3. Out of 132 screws in a pack, 12 screws are known to be defective. If one screw is picked up at random, the probability that it is a good screw is

A. $1/11$

B. $10/11$

C. $2/3$

D. $9/10$

Answer: B

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4. A bag contains five yellow balls and some white balls. If the probability of picking a white

ball is twice that of picking a yellow ball, how many white balls are there?

A. 20

B. 10

C. 16

D. 18

Answer: B

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5. A coin is tossed three times. If all the outcomes are identical, then I win. What is the chance that I lose?

A. $3/8$

B. $3/4$

C. $1/4$

D. $5/8$

Answer: C

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6. Probability of the event Monday will come before Tuesday is 1.

A.

(i)	(ii)	(iii)	(iv)
T	F	F	T

B.

(i)	(ii)	(iii)	(iv)
T	F	T	F

C.

(i)	(ii)	(iii)	(iv)
F	F	F	T

D.

(i)	(ii)	(iii)	(iv)
F	T	F	T

Answer: A

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7. Mean of first 20 natural numbers is 10.5

A. $\begin{matrix}(\mathrm{i}) & (\mathrm{ii}) & (\mathrm{iii}) & (\mathrm{iv}) \\ \mathrm{T} & \mathrm{F} & \mathrm{F} & \mathrm{T}\end{matrix}$

B. $\begin{matrix}(\mathrm{i}) & (\mathrm{ii}) & (\mathrm{iii}) & (\mathrm{iv}) \\ \mathrm{T} & \mathrm{F} & \mathrm{T} & \mathrm{F}\end{matrix}$

C. $\begin{matrix}(\mathrm{i}) & (\mathrm{ii}) & (\mathrm{iii}) & (\mathrm{iv}) \\ \mathrm{F} & \mathrm{F} & \mathrm{F} & \mathrm{T}\end{matrix}$

D. $\begin{matrix}(\mathrm{i}) & (\mathrm{ii}) & (\mathrm{iii}) & (\mathrm{iv}) \\ \mathrm{F} & \mathrm{T} & \mathrm{F} & \mathrm{T}\end{matrix}$

Answer: A

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8. Mode is the $\underline{\mathrm{P}}$ repeated score.

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9. There are 50 marbles of 3 colours: blue, yellow and black. The probability of picking up a blue marble is 3/10 and that of picking up a yellow marble is 1/2. The probability of picking up a black marble is

A. $1/5$

B. $1/10$

C. $1/4$

D. $4/5$

Answer: A

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10. A box has 20 balls of which x are red. When 4 more red balls are added and then a ball is picked up, the probability is 1/2. The value of x is

A. 4

B. 6

C. 8

D. 10

Answer: B

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11. A bag contains some green, white and pink beads. The probability of taking out one green bead is 1/3 and that of picking up one pick bead is 1/4. If it is known that the box has 10

white beads, how many beads were in the box initially?

A. 24

B. 25

C. 28

D. 32

Answer: A

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