

- Q1.** In a family having three children, there may be no girl, one girl, two girls or three girls. So, the probability of each is $\frac{1}{4}$. Is this correct? Justify your answer.
- Q2.** When we toss a coin, there are two possible outcomes-head or tail. Therefore, the probability of each outcome is $\frac{1}{2}$. Justify your answer.
- Q3.** If you toss a coin 6 times and it comes down heads on each occasion. Can you say that the probability of getting a head is 1? Give reasons.
- Q4.** Sushma tosses a coin 3 times and gets tail each time. Do you think that the outcome of next toss will be a tail? Give reasons.
- Q5.** If I toss a coin 3 times and get head each time, should I expect a tail to have a higher chance in the 4th toss? Give reason in support of your answer.
- Q6.** Two dice are thrown at the same time and the product of numbers appearing on them is noted. Find the probability that the product is less than 9.
- Q7.** A coin is tossed two times. Find the probability of getting atmost one head.
- Q8.** Two dice are thrown at the same time. Determine the probability that the difference of the numbers on the two dice is 2.
- Q9.** A letter of english alphabets is chosen at random. Determine the probability that the letter is a consonant.
- Q10.** The median of an ungrouped data and the median calculated when the same data is grouped are always the same. Do you think that this is a correct statement? Give reason.
- Q11.** In calculating the mean of grouped data, grouped in classes of equal width, we may use the formula,
- $$\bar{x} = a + \frac{\sum f_i d_i}{\sum f_i}$$
- Where, a is the assumed mean, a must be one of the mid-point of the classes. Is the statement correct? Justify your answer.
- Q12.** Is it true to say that the mean, mode and median of grouped data will always be different? Justify your answer.
- Q13.** Will the median class and modal class of grouped data always be different? Justify your answer.
- Q14.** A game consists of spinning an arrow which comes to rest pointing at one of the regions (1, 2 or 3) (see figure). Are the outcomes 1, 2 and 3 equally likely to occur? Give reasons.
- Q15.** Apoorv throws two dice one and computes the product of the numbers appearing on the dice. Peehu throws one die and squares the number that appears on it. Who has the better chance of getting the number 36? Why?
- Q16.** A student says that, if you throw a die, it will show up 1 or not 2. Therefore, the probability of getting 1 and the probability of getting not 1 each is equal to $\frac{1}{2}$. Is this correct? Give reasons.

- Q17.** I toss three coins together. The possible outcomes are no heads, 1 head, 2 head and 3 heads. So I say that probability of no heads is $\frac{1}{4}$. What is wrong with this conclusion?
- Q18.** A bag contains slips numbered from 1 to 100. If fatima chooses a slip at random from the bag, it will either be an odd number or an even number. Since, this situation has only two possible outcomes, so the probability of each is $\frac{1}{2}$. Justify.
- Q19.** Two dice are thrown at the same time. Find the probability of getting
 (i) same number on both dice. (ii) different number on both dice.
- Q20.** An integer is chosen between 0 and 100. What is the probability that it is
 (i) divisible by 7? (ii) not divisible by 7?
- Q21.** Cards with numbers 2 to 101 are placed in a box. A card is selected at random. Find the probability that the card has
 (i) an even number (ii) a square number
- Q22.** There are 1000 sealed envelopes in a box, 10 of them contain a cash prize of Rs. 100 each, 100 of them contain a cash prize of Rs. 50 each and 200 of them contain a cash prize of Rs. 10 each and rest do not contain any cash prize. If they are well shuffled and an envelope is picked up out, what is the probability that it contains no cash prize?
- Q23.** Box A contains 25 slips of which 19 are marked Rs. 1 and other are marked Rs. 5 each. Box B contains 50 slips of which 45 are marded Rs. 1 each and others are marked Rs. 13 each. Slips of both boxes are poured into a third box and resuffled. A slip is drawn at random. What is the probability that it is marked other than Rs. 1?
- Q24.** A carton of 24 bulbs contain 6 defective bulbs. One bulb is drawn at random. What is the probability that the bulb is not defective? If the bulb selected is defective and it is not replaced and a second bulb is selected at random from the rest, what is the probability that the second bulb is defective?
- Q25.** A child's game has 8 triangles of which 3 are blue and rest are red, and 10 squares of which 6 are blue and rest are red. One piece is lost at random. Find the probability that it is a
 (i) triangle (ii) square (iii) square of blue colour (iv) triangle of red colour
- Q26.** 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) whie.
- Q27.** A lot consists of 48 mobile phones of which 42 are good, 3 have only minor defects and 3 have major defects. Varnika will buy a phone, if it 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 it is
 (i) acceptable to Varnika? (ii) acceptable to the trader?
- Q28.** A die has its six faces marked 0, 1, 1, 1, 6, 6. Two such dice are thrown together and the total score is recorded.
 (i) How many different scores are possible? (ii) What is the probability of getting a total of 7?
- Q29.** Calculate the mean of the following data

Class	4 - 7	8 - 11	12 - 15	16 - 19
Frequency	5	4	9	10

- Q30.** Find the mean of the distribution

Class	1 - 3	3 - 5	5 - 7	7 - 10
Frequency	9	22	27	17

Q31. The daily income of sample of 50 employees are tabulated as follows.

Income (in Rs.)	4 - 7	8 - 11	12 - 15	16 - 19
Number of employees	5	4	9	10

Find the mean daily income of employees.

Q32. Weekly income of 600 families is tabulated below

Weekly income (in Rs.)	Number of families
0 - 1000	250
1000 - 2000	190
2000 - 3000	100
3000 - 4000	40
4000 - 5000	15
5000 - 6000	5
Total	34

Compute the median income.

Q33. In a game, the entry fee is of Rs. 5. The game consists of a tossing a coin 3 times. If one or two heads show, Sweta gets her entry fee back. If she throws 3 heads she receives double the 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 entry fee (iii) just gets her entry fee

Q34. All the jacks, queens and kings are removed from a deck of 52 playing cards. The remaining cards are well shuffled and then one card is drawn at random. Giving ace a value 1 similar value for other cards, find the probability that the card has a value.

- (i) 7 (ii) greater than 7 (iii) less than 7.

Q35. A bag contains 10 red, 5 blue and 7 green balls. A ball is drawn at random. Find the probability of this ball being a

- (i) red ball (ii) green ball (iii) not a blue ball

Q36. A coin is tossed three times. List the possible outcomes. Find the probability of getting

- (i) all heads (ii) atleast 2 heads

Q37. Two dice are numbered 1, 2, 3, 4, 5, 6 and 1, 1, 2, 2, 3, 3 respectively. They are thrown and the sum of the numbers on them is noted. Find the probability of getting each sum from 2 to 9. separately.

Q38. Two dice are thrown together. Find the probability that the product of the numbers on the top of the dice is

- (i) 6 (ii) 12 (iii) 7.

Q39. Two dice are thrown simultaneously. What is the probability that the sum of the numbers appearing on the dice is

- (i) 7? (ii) a prime number? (iii) 1?

Q40. The maximum bowling speeds, in km per hour, of 33 players at a cricket coaching centre are given as follows:

Speed (in km/h)	85 - 100	100 - 115	115 - 130	130 - 145
Number of players	11	9	8	5

Calculate the median bowling speed.

Q41. At a fete, cards bearing numbers 1 to 1000, one number on one card, are put in a box. Each player selects one card at random and that card is not replaced. If the selected card has a perfect square greater than 500, the player wins a prize. What is the probability that

- (i) the first player wins a prize?
- (ii) the second player wins a prize, if the first has won?

Q42. Calculate the mean of the scores of 20 students in a mathematics test

Marks	10 - 20	20 - 30	30 - 40	40 - 50	50 - 60
Number of students	2	4	7	6	1

Q43. The following table gives the number of pages written by Sarika for completing her own book for 30 days.

Number of pages written per day	16 - 18	19 - 21	22 - 24	25 - 27	28 - 30
Number of days	1	3	4	9	13

Find the mean number of pages written per day.

Q44. Form the frequency distribution table from the following data

Marks (Out of 90)	Number of candidates
More than or equal to 80	4
More than or equal to 70	6
More than or equal to 60	11
More than or equal to 50	17
More than or equal to 40	23
More than or equal to 30	27
More than or equal to 20	30
More than or equal to 10	32
More than or equal to 0	34

Q45. The following table shows the cumulative frequency distribution of marks of 800 students in an examination.

Marks	Number of students
Below 10	10
Below 20	50
Below 30	130
Below 40	270
Below 50	440
Below 60	570
Below 70	670
Below 80	740
Below 90	780
Below 100	800

Construct a frequency distribution table for the data above.

Q46. The following is the distribution of weights (in kg) of 40 persons.

Weight (in kg)	40 - 45	45 - 50	50 - 55	55 - 60	60 - 65	65 - 70	70 - 75	75 - 80
Number of persons	4	4	13	5	6	5	2	1

Construct a cumulative frequency distribution (of the less than type) table for the data above.

Q47. Given below is a cumulative frequency distribution showing the marks secured by 50 students of a class:

Marks	Below 20	Below 40	Below 60	Below 80	Below 100
Number of students	17	22	29	37	50

Form the frequency distribution table for the data.

Q48. The following are the ages of 300 patients getting medical treatment in a hospital on a particular day

Age (in year)	10 - 20	20 - 30	30 - 40	40 - 50	50 - 60	60 - 70
Number of patients	60	42	55	70	53	20

Form

(i) Less than type cumulative frequency distribution.

(ii) More than type cumulative frequency distribution.

Q49. Find the unknown entries a, b, c, d, e and f in the following distribution of heights of students in a class:

Height (in cm)	Frequency	Cumulative frequency
150 - 155	12	a
155 - 160	b	25
160 - 165	10	c
165 - 170	d	43
170 - 175	e	48
175 - 180	2	f
Total	50	

Q50. Find the mean marks of students for the following distribution:

Marks	Number of students
0 and above	80
10 and above	77
20 and above	72
30 and above	65
40 and above	55
50 and above	43
60 and above	28
70 and above	16
80 and above	10
90 and above	8
100 and above	0

Q51. The weight of coffee in 70 packets are shown in the following table

Weekly income (in Rs.)	Number of families
200 - 201	12
201 - 202	26
202 - 203	20
203 - 204	9
204 - 205	2
205 - 206	1

Determine the modal weight.

Q52. The monthly income of 100 families are given as below

Income (in Rs.)	Number of families
0 - 5000	8
5000 - 10000	26
10000 - 15000	41
15000 - 20000	16
20000 - 25000	3
25000 - 30000	3
30000 - 35000	2
35000 - 40000	1

Calculate the modal income.

Q53. The weights of tea in 70 packets are shown in the following table

Weight (in g)	200 - 201	201 - 202	202 - 203	203 - 204	204 - 205	205 - 206
Number of packets	13	27	18	10	1	1

Find the mean weight of packets.

Q54. Find the mean age of 100 residents of a town from the following data.

Age equal and above (in years)	0	10	20	30	40	50	60	70
Number of persons	100	90	75	50	25	15	5	0

Q55. Determine the mean of the following distribution:

Marks	Number of students
Below 10	5
Below 20	9
Below 30	17
Below 40	29
Below 50	45
Below 60	60
Below 70	70
Below 80	78
Below 90	83
Below 100	85

Q56. The table below shows the salaries of 280 persons.

Salary (in Rs. thousand)	Number of persons
5 - 10	49
10 - 15	133
15 - 20	63
20 - 25	15
25 - 30	6
30 - 35	7
35 - 40	4
40 - 45	2
45 - 50	1

Calculate the median and mode of the data.

Q57. The weights of tea in 70 packets are shown in the following table

Weight (in g)	200 - 201	201 - 202	202 - 203	203 - 204	204 - 205	205 - 206
Number of packets	13	27	18	10	1	1

Draw the less than type and more than type ogives for the data and use them to find the median weight.

Q58. The weights of tea in 70 packets are shown in the following table

Weight (in g)	200 - 201	201 - 202	202 - 203	203 - 204	204 - 205	205 - 206
Number of packets	13	27	18	10	1	1

Draw the less than type ogive for this data and use it to find the median weight.

Q59. The following is the frequency distribution of duration for 100 calls made on a mobile phone.

Duration (in s)	95 - 125	125 - 155	155 - 185	185 - 215	215 - 245
Number of calls	14	22	28	21	15

Calculate the average duration (in sec) of a call and also find the median from a cumulative frequency curve.

Q60. The annual rainfall record of a city for 66 days is given in the following table.

Rainfall (in cm)	0 - 10	10 - 20	20 - 30	30 - 40	40 - 50	50 - 60
Number of days	22	10	8	15	5	6

Calculate the median rainfall using ogives (or more than type and of less than type)

Q61. Size of agricultural holdings in a survey of 200 families is given in the following table

Size of agricultural	Number of
0 - 5	10
5 - 10	15
10 - 15	30
15 - 20	80
20 - 25	40
25 - 30	20
30 - 35	5

Calculate the median and mode size of the holdings.

Q62. The distribution of heights (in cm) of 96 children is given below:

Height (in cm)	Number of children
124 - 128	5
128 - 132	8
132 - 136	17
136 - 140	24
140 - 144	16
144 - 148	12
148 - 152	6
152 - 156	4
156 - 160	3
160 - 164	1

Draw a less than type cumulative frequency curve for this data and use it to compute median height of the children.

Q63. The median of the following data is 50. Find the values of p and q , if the sum of all the frequencies is 90.

Marks	20 - 30	30 - 40	40 - 50	50 - 60	60 - 70	70 - 80	80 - 90
Frequency	p	15	25	20	q	8	10

Q64. The mean of the following frequency distribution is 50 but the frequencies f_1 and f_2 in classes 20 - 40 and 60 - 80, respectively are not known. Find these frequencies, if the sum of all the frequencies is 120.

Class	0 - 20	20 - 40	40 - 60	60 - 80	80 - 100
Frequency	17	f_1	32	f_2	19

Q65. 50 students enter for a school javelin throw competition. The distance (in metre) shown are recorded below:

Distance (in m)	0 - 20	20 - 40	40 - 60	60 - 80	80 - 100
Number of students	6	11	17	12	4

- (i) Construct a cumulative frequency table.
- (ii) Draw a cumulative frequency curve (less than type) and calculate the median distance drawn by using this curve.
- (iii) Calculate the median distance by using the formula for median.
- (iv) Are the median distance calculated in (ii) and (iii) same?

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S1. No.**S2.** Yes.**S3.** No.**S4.** Theory.**S5.** No.**S6.** $4/9$.**S7.** $3/4$.**S8.** $2/9$.**S9.** $21/26$.**S10.** Not always.**S11.** No.**S12.** No.**S13.** Not always.**S14.** No.**S15.** Peehu has better chance of getting no. 36.**S16.** No.**S17.** The probability if no head is $\frac{1}{8}$ not $\frac{1}{4}$ is wrong conclusion.**S18.** Theory.**S19.** (i) $1/6$ (ii) $5/6$ **S20.** (i) $14/99$ (ii) $85/99$ **S21.** (i) $1/2$ (ii) $9/100$ **S22.** 0.69.**S23.** $11/75$.**S24.** $5/23$.**S25.** (i) $4/9$ (ii) $5/9$ (iii) $1/3$ (iv) $5/18$

S26. (i) $5/6$

(ii) $1/3$

S27. (i) $7/8$

(ii) $15/16$

S28. (i) 6

(ii) $1/3$

S29. 12.93.

S30. 5.5

S31. 356.5

S32. Median income is Rs. 1263.15

S33. (i) $1/8$

(ii) $1/8$

(iii) $3/4$

S34. (i) $1/10$

(ii) $3/10$

(iii) $3/5$

S35. (i) $5/11$

(ii) $7/22$

(iii) $17/22$

S36. (i) $1/8$

(ii) $1/2$

S37. Do yourself.

S38. (i) $1/9$

(ii) $1/9$

(iii) 0

S39. (i) $1/6$

(ii) $5/12$

(iii) 0

S40. 109.17 km h^{-1} .

S41. (i) 0.009

(ii) $8/999$

S42. 35.

S43. 26.

S44. Do yourself.

S45. Do yourself.

S46. Do yourself.

S47. Do yourself.

S48. (i) Do yourself.

(ii) Do yourself.

S49. $a = 12, b = 13, c = 35, d = 8, e = 5, f = 50$.

S50. Mean = 51.75

S51. Modal weight = 201.79

S52. Modal income Rs. 11,875.

S53. Mean weight = 201.969

S54. Mean age = 31 years.

- S55. Mean = 48.41
- S56. Median = Rs. 13421 and Mode = 12727.
- S57. Draw yourself. Median weight = 201.89
- S58. Draw yourself. Median weight = 201.89
- S59. Average duration = 170.3, Median = 170.
- S60. Median rainfall = 21 - 25 cm.
- S61. Median = 17.81 hec. and Mode = 17.77 hec.
- S62. Draw yourself. Median height = 141.17
- S63. $p = -5$, $q = 7$.
- S64. $f_1 = 28$, $f_2 = 24$.

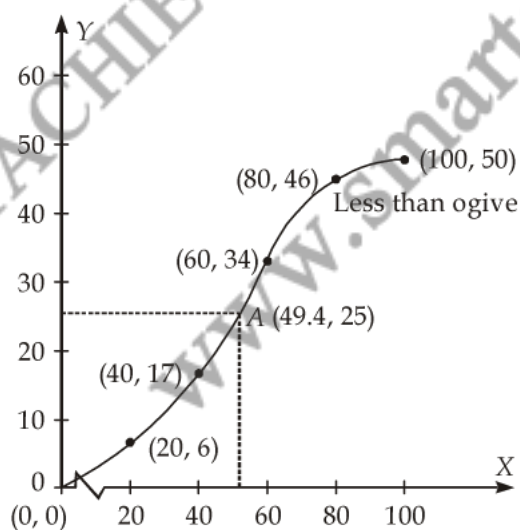
S65. (i)

Distance (in m)	Number of students (f_1)	Cumulative frequency (cf)
0 - 20	6	6
20 - 40	11	17
40 - 60	17	34
60 - 80	12	46
80 - 100	4	50

(ii)

Distance (in m)	Cumulative frequency
0	0
Less than 20	6
Less than 40	17
Less than 60	34
Less than 80	46
Less than 100	50

To draw less than type ogive, we plot (0, 0), (20, 6), (40, 17), (60, 34), (80, 46), (100, 50), join all these points by free hand.



(iii) Median = 49.41

(iv) Yes, median distance travelled by parts (ii) and (iii) are same.