MATHS

BOOKS - NCERT MATHS (ENGLISH)

STATISTICS AND PROBABILITY

Multiple Choice Questions

1. The mark of the class $90 - 120$ is

A. 90

B. 105

C. 115

D. 120

Answer: B

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2. The range of the data 25, 18, 20, 22, 16, 6, 17, 15, 12, 30, 32, 10, 19, 8, 11 and 20 is

A. 10

B. 15

C. 18

D. 26

Answer: D

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3. In a frequency distribution, the mid values of a class is 10 and width of the class is 6. The lower limit of the class is

A. 6.5

B. 7.5

C. 8.5

D. 12

Answer: B

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4. The width of each of five continuous classes in a frequency distribution is 5 and the lower class limit of the lowest class is 10. The upper class limit of the highest class is

A. 15

B. 25

C. 35

D. 40

Answer: C

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5. If m is the mid-point and l is the upper limit of a class in a continuous frequency distribution, then lower class limit of the class is

A. $2m + l$

B. $2m - l$

C. $m - l$

D. $m - 2l$

Answer: B

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6. The class marks of a frequency distribution are given as follows 15,20, 25,..... The class corresponding to the class mark 20 is

A. $12.5 - 17.5$

B. $16.5 - 21.5$

C. $18.5 - 21.5$

D. $19.5 - 20.5$

Answer: C

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7. In the class intervales 10-20, 20-30, the number is 20 is included in

A. 10-20

B. 20-30

C. Both the intervals

D. None of these

Answer: C

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8. A ground frequency table with class intervals of equal sizes using $250 - 270$ (270 not included in this interval) as one of the class interval is constructed for the for the following data

268,220,368,258,242,310,272,342,

310, 290, 300, 320, 319, 304, 402, 338,

406, 292, 354, 278, 210, 240, 330, 336,

406, 215, 258, 236.

The frequency of the class 310-330 is

A. 4

B. 5

C. 6

D. 7

Answer: D

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9. A grouped frequency distribution table with classes of equal sizes using 63-72 (72 included) as one of the class is constructed for the following data

30,32,45,54,74,78,108,112,66,66,76,88,

40, 14, 20,15,35,44,66,75,84,95,96,102,110,88,74,112,14,34,44.

The number of classes in the distribution will be

A. 9

B. 10

C. 11

D. 12

Answer: B

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10. To draw a histogram to represent the following frequency distribution.

The adjusted frequency for the class 25-45 is

A. 6

B. 5

C. 3

D. 2

Answer: D

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11. The mean of five numbers is 30. If one number is excluded, their mean becomes 28. The excluded number is

A. 28

B. 30

C. 35

D. 38

Answer: D

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12. If the mean of the observation $x,\ x+3,\ x+5,\ x+7$ and $x+10$ is $9,$ then mean of the last three observations is

A. $\frac{101}{3}$

B. $\frac{102}{3}$

C. $11\frac{1}{3}$

D. $\frac{112}{3}$

Answer: C

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13. If $\bar{x}$ represents the mean of n observations $x_1, x_2, \ldots\ldots\ldots, x_n$, then values of $\Sigma_{i=1}^{n}(x_i - \bar{x})$

A. -1

B. 0

C. 1

D. $n - 1$

Answer: B

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14. If each observation of the data is increased by 5, then their mean

A. remains the same

B. becomes 5 times the original mean

C. is decreased by 5

D. is increased by 5

Answer: D

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15. Let $\bar{x}$ be the mean of $x_1, x_2, \ldots\ldots\ldots, x_n$ and $\bar{y}$ be the mean of $y_1, y_2, \ldots\ldots\ldots\ldots, y_n$.

If $\bar{z}$ is the mean of $x_1, x_2, \ldots\ldots\ldots\ldots\ldots\ldots x_n, y_1, y_2, \ldots\ldots\ldots\ldots, y_n$, then $\bar{z}$ is equal to

A. $\bar{x} + \bar{y}$

B. $\dfrac{\bar{x} + \bar{y}}{2}$

C. $\dfrac{\bar{x} + \bar{y}}{n}$

D. $\dfrac{\bar{x} + \bar{y}}{2n}$

Answer: B

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16. Let $\bar{x}$ be the mean of $x_1, x_2, \ldots\ldots\ldots, x_n$ and $\bar{y}$ be the mean of $y_1, y_2, \ldots\ldots\ldots, y_n$. If $\bar{z}$ is the mean of $x_1, x_2, \ldots\ldots\ldots\ldots\ldots x_n, y_1, y_2, \ldots\ldots\ldots\ldots, y_n$, then $\bar{z}$ is equal to

A. $\left(a+\frac{1}{a}\right)\bar{x}$

B. $\left(a+\frac{1}{a}\right)\frac{\bar{x}}{2}$

C. $\left(a+\frac{1}{a}\right)\frac{\bar{x}}{n}$

D. $\frac{\left(a+\frac{1}{a}\right)\bar{x}}{2n}$

Answer: B

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17. If $\bar{x}_1, \bar{x}_2, \bar{x}_3, \ldots\ldots\ldots\bar{x}_n$ are the means of n groups with $n_1, n_2, \ldots\ldots\ldots\ldots, n_n$ number of observations, respectively, then the mean $\bar{x}$ of all the groups taken together is given by

A. underset(i=1)overset(n)Sigman_(i)barx_(i)`

B. (underset(i=1)overset(n)Sigman_(i)barx_(i))/(n^(2))`

C. (underset(i=1)overset(n)Sigman_(i)barx_(i))/(underset(i=1)overset(n)Sigm

D. (underset(i=1)overset(n)Sigman_(i)barx_(i))/(2n)

Answer: C

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18. The mean of 100 observation is 50. If one of the observation which was 50 is replaced by 150, the resulting mean will be

A. 50.5

B. 51

C. 51.5

D. 52

Answer: B

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19. There are 50 numbers. Each number is subtracted from 53 and the mean of the number so obtained is found to be $= 3.5$. The mean of the given number is

A. 46.5

B. 49.5

C. 53.5

D. 56.5

Answer: C

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20. The mean of 25 observation is 36. Out of these observations, if the mean of first 13 observations is 32 and that of the last 13 observations is 40, the $13th$ observation is

A. 23

B. 36

C. 38

D. 40

Answer: B

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21. The median of the data 78, 56, 22, 34, 45, 54, 39, 68, 54 and 84 is

A. 45

B. 49.5

C. 54

D. 56

Answer: C

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22. For drawing a frequency polygon of a continuous frequency distribution, we plot the points whose ordinates are the frequencies of the respecitve classes and abscissae are, respectively

A. upper limits of the classes

B. lower limites of the classes

C. class marks of the classes

D. upper limits of preceeding classes

Answer: D

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23. Median of the following numbers

$4, 4, 5, 7, 6, 7, 7, 12, 3$ is

A. 4

B. 5

C. 6

D. 7

Answer: C

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24. The mode of given data 15, 14, 19, 20, 14, 15, 16, 14, 15, 18, 14, 19, 15, 17 and 15 is

A. 14

B. 15

C. 16

D. 17

Answer: B

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25. In a sample study of 642 people, it was found that 514 people have a high school certificate. If a person is selected at random, the probability that the person has a high school certificate, is

A. 0.5

B. 0.6

C. 0.7

D. 0.8

Answer: D

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26. In a survey of 364 children aged $19 - 36$ months, it was found that 91 liked to eat potato chips. If a child is selected at random, the probability that he/she does not like to eat potato chips, is

A. 0.25

B. 0.50

C. 0.75

D. 0.80

Answer: C

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27. In a medical examination of students of a class, the following blood groups are recorded.

Blood group	A	AB	B	O
Number of students	10	13	12	5

A student is selected at random from the class. The probability that he/she has blood group B, is

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

B. $\frac{13}{40}$

C. $\frac{3}{10}$

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

Answer: C

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28. Two coins are tossed 1000 times and the outcomes are recorded as below

Number of heads	2	1	0
Frequency	200	550	250

Based on this information, the probability for atmost one head is

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

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

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

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

Answer: C

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29. 80 bulbs are selected at random from a lot and their time (in hours) is recorded in the form of a frequency table given below

Life time (in hours)	300	500	700	900	1100
Frequency	10	12	23	25	10

One bulb is selected at random from the lot. The probability that its life is $1150\ h$, is

A. $\frac{1}{80}$

B. $\frac{7}{16}$

C. 0

D. 1

Answer: C

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30. The probability that bulbs selected randomly from the lot has life less than 900 h, is

A. $\frac{11}{40}$

B. $\frac{5}{16}$

C. $\frac{7}{16}$

D. $\frac{9}{16}$

Answer: D

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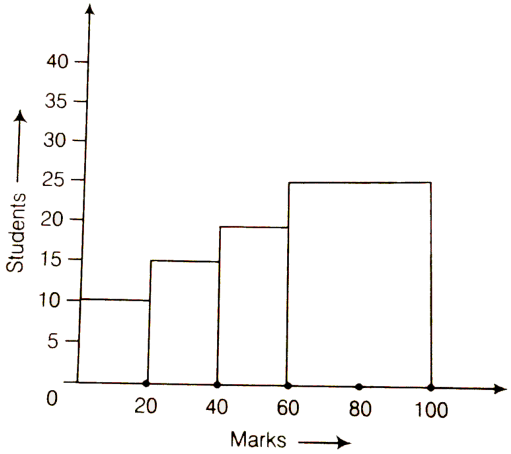
Very Short Answer Types Questions

1. The frequency distributions been represented graphically as follows.

Marks	0-20	20-40	40-60	60-100
Number of students	10	15	20	25



Do you think representation is correct? Why?

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2. In a diagnostic test in mathematics given to students, the following marks (out of 100) are recorded 46,52,48,11,41,62,54,53,96,40,98 and 44. Which average will be a good representative of the above data and why?

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3. A child says that the median of $3, 14, 18, 20$ and 5 is 18. What does the child not understand about finding the median?

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4. A football player scored the following number of goals in the 10 matches $1, 3, 2, 5, 8, 6, 1, 4, 7$ and 9. Since, the number of matches is 10 (an even number), therefore

Median $= (5th$ observation $+ \ 6th$ observation$)/2 = (8 + 6)/2 = 7$

Is it the correct answer and why?

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5. Is it correct to say that in a histrogram, the area of each rectangle is proportional to the class size of the corresponding class interval? If not, correct the statement.

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6. The class marks of a continuous distribution are 1.04, 1.14, 1.24, 1.34, 1.44, 1.54 and 1.54

Is it correct to say the last interval will be $1.55 - 1.73$? Justify your answer.

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7. 30 children were asked about the number of hours they watched TV programmes last week. The result are recorded as under

Number of hours	0-5	5-10	10-15	15-20
Frequency	8	16	4	2

Can we say that the number of children who watched TV for 10 or more hour in a week 22? Justify your answer.

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8. Can the experimental probability of an event be a negative number? If not, why?

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9. Can the experimental probabilty of an event be greater than 1? Justify your answer.

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10. As the number of tosses of a coin increases the ratio of the number of heads to the total number of tosses will be $\frac{1}{2}$. Is it correct? If not, write the correct one.

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Short Answer Type Questions

1. The blood groups of 30 students are recorded as follows:

A, B, O, A, AB, O, A, O, B, A, OB, B, A, AB, B, A,AB ,B, A, A, O, A, AB, B, A, O, B, A, B,

A

Prepare a frequency distribution table for the data.

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2. The value of π upto 35 decimal places is given below

$3.14159265358973238462643383277950288$

Make a frequency distribution of the digits 0 to 9 after the decimal point.

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3. The scores (out of 100) obtained by 33 students in a mathematics test are as follows

69.48.84,58,48,73,83,48,66,58,84,66,64,71,64,66,69,66,83,66,69,71,81,71,73,69,66,66,6

Represent this data in the form of a frequency distribution.

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4. Prepare a continuous grouped frequency distribution from the following data

Mid-point	Frequency
5	4
15	8
25	13
35	12
45	6

Also, find the size of class intervals.

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5. Convert the given frequency distribution into a continuouos grouped frequency distribution.

Class interval	Frequency
150 - 153	7
154 - 157	7
158 - 161	15
162 - 165	10
166 - 169	5
170 - 173	6

In which intervals would 153.5 and 157.5 be included?

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6. The expenditure of a family of different heads in a month is given below

Head	Food	Education	Clothing	House rent	Others	Savings
Expenditure (₹)	4000	2500	1000	3500	2500	1500

Draw a bar graph to represent the data above.

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7. Expenditure on education of a country during a five years period (2002-2006), in crore of rupees, is given below

Elementary Education	240
Secondary Education	120
University Education	190
Teacher's Training	20
Social Education	10
Other Educational Programmes	115
Cultural Programmes	25
Technical Education	125

Represent the information above by a bar graph.

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8. The following table gives the frequencies of most commonly used letters a,e,I,o,r,t,u, from a page of a book

Letters	*a*	*e*	*i*	*o*	*r*	*t*	*u*
Frequency	75	125	80	70	80	95	75

Represent the information above by a bar graph.

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9. If the mean of the following data is 20.2, then find the value of p.

x	10	15	20	25	30
f	6	8	p	10	6

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10. Obtain the mean of the following distribution.

Frequency (f_i)	Variable (x_i)
4	4
8	6
14	8
11	10
3	12

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11. A class consists of 50 students out of which 30 are girls. The mean of marks scored by girls in a test is 73 (out of 100) and that of boys is 71. Determine the mean score of the whole class.

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12. Mean of 50 observations was found to be 80.4. But later on, it was discovered that 96 was misread as 69 at one place. Find the correct mean.

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13. Ten observations 6, 14, 15, 17, $x+1$, $2x-13$, 30, 32, 34 and 43 are written in an ascending order. The median of the data is 24. Find the value of x.

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14. The points scored by a basket ball team in a series of matches are as follows

17, 2, 7, 27, 25, 5, 14, 18, 10, 24, 48, 10, 8, 7, 10, 28

Find the median and mode for the data.

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15. In the figure, there is histrogram depicting daily wages of workers in a factory. Construct the frequency distribution table.

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16. A company selected 4000 households at random and surveyed them to find out a relationship between income level and the number of televisions sets in a home. The information, so obtained is listed in the following table.

Monthly income (in ₹)	**Number of televisions/households**			
	0	**1**	**2**	**Above 2**
< 10000	20	80	10	0
10000-14999	10	240	60	0
15000-19999	0	380	120	30
20000-24999	0	520	370	80
25000 and above	0	1100	760	220

Find the probability

i) of a household earning Rs 10000- Rs 14999 per year and having exactly one television.

ii) of a household earning Rs 25000 and more per year owning 2 televisions.

iii) of a household not having any television.

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17. Two dice are thrown simultaneouly 500 times. Each time the sum of the two numbers appearing on their tops is noted and recorded as given in the following table

Sum	Frequency
2	14
3	30
4	42
5	55
6	72
7	75
8	70
9	53
10	46
11	28
12	15

If the dice are thrown once more, then what is probability of getting a sum

i) 3?

ii) More than 10?

iii) Less than or equal to 5?

iv) Between 8 and 12?

A. 3?

B. more than 10?

C. less than or equal to 5?

D. between 8 and 12?

Answer:

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18. Bulbs are packed in cartons each containing 40 bulbs, seven hundred cartons were examined for defective bulbs and the results are given in the following table.

Number of defective bulbs	0	1	2	3	4	5	6	More than 6
Frequency	400	180	48	41	18	8	3	2

One carton was selected at random. What is the probability that it has

i) no defective bulb?

ii) defective bulbs from 2-6?

iii) defective bulbs less than 4?

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19. Over the past 200 working days, the number of defective parts produced by a machine is given is given in the followig table.

Number of defective parts	0	1	2	3	4	5	6	7	8	9	10	11	12	13
Days	50	32	22	18	2	2	10	10	10	8	6	6	2	2

Determine the probability that tomorrow's output will have

A. no defective part.

B. atleast one defective part.

C. nor more than 5 defective parts.

D. more than 13 defective parts.

Answer:

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20. A recent survey found that the edges ages of workers in a factory as follow.

Age (in years)	20-29	30-39	40-49	50-59	60 and above
Number of workers	38	27	86	46	3

If a person is selected at random, find the probability that the person is

A. 40 yr or more

B. under 40 yr

C. having age from 30-39 year.

D. under 60 but over 39 year.

Answer:

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Long Answer Type Questions

1. The marks obtained by 40 students of class VIII in an examination are given below: 16,17,18,3,7,23,18,13,10,21,7,1,13,21,13,15,19,24,16,3, 23,5,12,18,8,12,6,8,16,5,3,5,0,7,9,12,20,10,2,23 Divide the data into five groups, namely 0-5, 5-10, 10-15, 15-20 and 20-25 and prepare a grouped frequency table.

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2. Construct a grouped frequency distribution table with width 10 of each class, in such a way that one of the class is 10-20 (20 not included).

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3. Draw a histogram of the following distribution.

Height (in cm)	**Number of students**
150-153	7
153-156	8
156-159	14
159-162	10
162-165	6
165-168	5

Watch Video Solution

4. Draw a histogram to represent the following grouped frequency distribution.

Age (in years)	**Number of teachers**
20-24	10
25-29	28
30-34	32
35-39	48
40-44	50
45-49	35
50-54	12

View Text Solution

5. The lengths of 62 levels of a plant are measured in millimetres and the data is represented in the following table

Length (in mm)	**Number of leaves**
118-126	8
127-135	10
136-144	12
145-153	17
154-162	7
163-171	5
172-180	3

Draw a histrogram to represent the data above.

View Text Solution

6. The marks obtained (out of 100) by a class of 80 students are given below

Marks	Number of students
10-20	6
20-30	17
30-50	15
50-70	16
70-100	26

View Text Solution

7. Following table shows a frequency distribution for the speed of cars passing through at a particular spot on a high way.

Class interval (km/h)	Frequency
30-40	3
40-50	6
50-60	25
60-70	65
70-80	50
80-90	28
90-100	14

Draw a histogram and frequency polygon representing the data above.

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8. Refer to Q. 7. Draw the frequency polygon representing the above data without drawing the histogram.

View Text Solution

9. Following table gives the distribution of students of sections A and B of a class according to the marks obtained by them.

Section *A*		Section *B*	
Marks	**Frequency**	**Marks**	**Frequency**
0 15	5	0-15	3
15-30	12	15-30	16
30 45	28	30-45	25
45 60	30	45 60	27
60-75	35	60-75	40
75-90	13	75-90	10

Represent the marks of the students of both the sections on the same graph by two frequency polygons. What do you observe?

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10. The mean of the distribution is 50.

x	10	30	50	70	90
f	17	$5a+3$	32	$7a-11$	19

Find the value of a and hence the frequencies of 30 and 70.

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11. The mean marks (out of 100) of boys and girls in an examination are 70 and 73, respectively. If the combined mean of marks of all the students in that examination is 71, find the ratio of the number of boys to the number of girls.

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12. A total of 25 patients admitted to a hospital are tested for levels of blood sugar, (mg/dl) and the results obtained were as follows.

87	71	83	67	85
77	69	76	65	85
85	54	70	68	80
73	78	68	85	73
81	78	81	77	75

Find mean, median and mode (mg/dl) of the above data.

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