Frequency Distribution Tables & Graphs

Exercise 7.1

Q. 1. Find the arithmetic mean of the sales per day in a fair price shop in a week.

Rs. 10000, Rs.10250, Rs.10790, Rs.9865, Rs.15350, Rs.10110

Answer : Given, observations 10000, 10250, 10790, 9865, 15350, 10110

Clearly, No of observations, n = 6

We know,

Arithmetic mean of x_1, x_2, x_3, …, x_n (n observations) is

$$\bar{x} = \frac{x_1 + x_2 + x_3 + \cdots + x_n}{n}$$

Therefore, mean of above data

$$\bar{x} = \frac{10000 + 10250 + 10790 + 9865 + 15350 + 10110}{6}$$

$$\bar{x} = \frac{66365}{6} = 110060.83$$

Hence, mean is Rs. 110060.83

Q. 2. Find the mean of the data; 10.25, 9, 4.75, 8, 2.65, 12, 2.35

Answer : Given, observations 10.25, 9, 4.75, 8, 2.65, 12, 2.35

Clearly, No of observations, n = 7

We know,

Arithmetic mean of x_1, x_2, x_3, …, x_n (n observations) is

$$\bar{x} = \frac{x_1 + x_2 + x_3 + \cdots + x_n}{n}$$

Therefore, mean of above data

$$\bar{x} = \frac{10.25 + 9 + 4.75 + 8 + 2.65 + 12 + 2.35}{7}$$

$$\bar{x} = \frac{49}{7} = 7$$

Hence, mean is 7

Q. 3. Mean of eight observations is 25. If one observation 11 is excluded, find the mean of the remaining.

Answer : Given, Mean of 8 observations is 25.

Clearly, No of observations, n = 8 and mean, $\bar{x} = 25$

We know,

Arithmetic mean of x_1, x_2, x_3, …, x_n (n observations) is

$$\bar{x} = \frac{x_1 + x_2 + x_3 + \cdots + x_n}{n}$$

$$\Rightarrow 25 = \frac{x_1 + x_2 + \cdots + x_8}{8}$$

$$\Rightarrow x_1 + x_2 + \cdots + x_8 = 200$$

⇒ Sum of terms is 200.

If one observation 11 is excluded,

No of terms = 7

Sum of terms = 200 – 11 = 189

$$\Rightarrow \text{mean}, \bar{x} = \frac{\text{Sum of observations}}{\text{No of observations}}$$

$$\Rightarrow \bar{x} = \frac{189}{7} = 27$$

Hence, new mean is 27.

Q. 4. Arithmetic mean of nine observations is calculated as 38. But in doing so, an observation 27 is mistaken for 72. Find the actual mean of the data.

Answer : Given, mean, $\bar{x} = 38$

No of observations, n = 9

We know,

Arithmetic mean of $x_1, x_2, x_3, \ldots, x_n$ (n observations) is

$$\bar{x} = \frac{x_1 + x_2 + x_3 + \cdots + x_n}{n}$$

$$\Rightarrow 38 = \frac{x_1 + x_2 + \cdots + x_9}{9}$$

⇒ Sum of observations = $x_1 + x_2 + \ldots + x_9 = 342$

As, 27 is mistaken for 72, therefore, actual sum of observations will increase by (72 - 27) = 45

⇒ Actual sum of observations = 342 + 45 = 387

$$\Rightarrow \text{mean}, \bar{x} = \frac{\text{Sum of observations}}{\text{No of observations}}$$

$$\Rightarrow \bar{x} = \frac{387}{9} = 43$$

Hence, new mean is 43.

Q. 5. Five years ago mean age of a family was 25 years. What is the present mean age of the family?

Answer : Let the no of members in family be 'n'.

Mean age = 25

Let $x_1, x_2, \ldots, x_n$ be ages of family members.

We know,

Arithmetic mean of $x_1, x_2, x_3, \ldots, x_n$ (n observations) is

$$\bar{x} = \frac{x_1 + x_2 + x_3 + \cdots + x_n}{n}$$

Therefore, 5 years ago

$$\Rightarrow \text{mean age}, \bar{x} = \frac{x_1 + x_2 + \cdots + x_n}{n}$$

$$\Rightarrow 25 = \frac{(x_1 + x_2 + \cdots + x_n)}{n}$$

$\Rightarrow x_1 + x_2 + \ldots + x_n = 25n$ [1]

In present, age of each family member will be increase by 5, therefore ages will be

$x_1 + 5, x_2 + 5, \ldots, x_n + 5$

$$\Rightarrow \text{Present mean age}, \bar{x'} = \frac{x_1 + 5 + x_2 + 5 + x_3 + 5 + \cdots + x_n + 5}{n}$$

$$\Rightarrow \bar{x'} = \frac{(x_1 + x_2 + \cdots + x_n) + (5 + 5 + \cdots \{n \text{ times}\})}{n}$$

$$\Rightarrow \bar{x'} = \frac{25n + 5n}{n} \text{ [From 1]}$$

$$\Rightarrow \bar{x'} = \frac{30n}{n} = 30$$

Hence, Present mean age is 30.

Q. 6. Two years ago the mean age of 40 people was 11 years. Now a person left the group and the mean age is changed to 12 years. Find the age of the person who left the group.

Answer : No of members = 40

Mean age two years ago = 11

Let $x_1, x_2, \ldots, x_{40}$ be ages of family members.

We know,

Arithmetic mean of $x_1, x_2, x_3, \ldots, x_n$ (n observations) is

$$\bar{x} = \frac{x_1 + x_2 + x_3 + \cdots + x_n}{n}$$

Therefore, two years ago

$$\Rightarrow \text{mean age}, \bar{x} = \frac{x_1 + x_2 + \cdots + x_{40}}{40}$$

$$\Rightarrow 11 = \frac{(x_1 + x_2 + \cdots + x_{40})}{40}$$

$\Rightarrow x_1 + x_2 + \ldots + x_{40} = 440$ [1]

In present, age of each family member will be increase by 2, therefore ages will be

$x_1 + 2, x_2 + 2, \ldots, x_{40} + 2$

But as a person left the group, let his present age be 'x' years

In this case, Sum of ages will be decrease by 'x' and No of persons will be 39.

$$\Rightarrow \text{Present mean age}, \bar{x'} = \frac{x_1 + 2 + x_2 + 2 + x_3 + 2 + \cdots + x_{40} + 2 - x}{39}$$

$$\Rightarrow 12 = \frac{(x_1 + x_2 + \cdots x_{40}) + (2 + 2 + \cdots \text{upto 40 times}) - x}{39}$$

$\Rightarrow 468 = 440 + 80 - x$ [From 1]

$\Rightarrow x = 520 - 468$

$\Rightarrow x = 52$

Present age of that person is 52 years.

Q. 7. Find the sum of deviations of all observations of the data 5, 8, 10, 15, 22 from their mean.

Answer : Given, observations 5, 8, 10, 15, 22

Clearly, No of observations, n = 5

We know,

Arithmetic mean of x_1, x_2, x_3, …, x_n (n observations) is

$$\bar{x} = \frac{x_1 + x_2 + x_3 + \cdots + x_n}{n}$$

Therefore, mean of above data

$$\bar{x} = \frac{5 + 8 + 10 + 15 + 22}{6}$$

$$\bar{x} = \frac{60}{5} = 12$$

Hence, mean is 12

Now, we know deviation

$d_i = x_i - a$

In this case, a = 12

$d_1 = x_1 - a = 5 - 12 = -7$

$d_2 = x_2 - a = 8 - 12 = -4$

$d_3 = x_3 - a = 10 - 12 = -2$

$d_4 = x_4 - a = 15 - 12 = 3$

$d_5 = x_5 - a = 22 - 12 = 10$

Sum of deviations = (-7) + (-4) + (-2) + 3 + 10 = 0

Hence, sum of deviations from their mean is 0.

Q. 8. If sum of the 20 deviations from the mean is 100, then find the mean deviation.

Answer : Given, No of deviations = 20

Sum of deviations = 100

We know,

$$\text{Mean deviation} = \frac{\text{Sum of deviations}}{\text{No of deviations}}$$

$$\Rightarrow \text{Mean deviation} = \frac{100}{20}$$

$$\Rightarrow \text{Mean deviation} = 5$$

Hence, mean deviation is 5.

Q. 9. Marks of 12 students in a unit test are given as 4, 21, 13, 17, 5, 9, 10, 20, 19, 12, 20, 14.

Assume a mean and calculate the arithmetic mean of the data. Assume another number as mean and calculate the arithmetic mean again. Do you get the same result? Comment.

Answer : Given, observations are 4, 21, 13, 17, 5, 9, 10, 20, 19, 12, 20, 14

Let assumed mean, a = 17

We know, mean by assumed mean method is

$$\bar{x} = a + \frac{\sum_{i=1}^{n}(x_i - a)}{n}$$

Where, a is assumed mean and n is no of observations and x_i's are observations.

Therefore, mean for given data

$$\bar{x} = 17 + \frac{-13 + 4 + (-4) + 0 + (-12) + (-8) + (-7) + 3 + 2 + (-5) + 3 + (-3)}{12}$$

$$\Rightarrow \bar{x} = 17 + \frac{-40}{12} = 17 - \frac{10}{3}$$

$$\Rightarrow \bar{x} = \frac{41}{3}$$

Now, let assumed mean a = 14

$$\bar{x} = 14 + \frac{-10 + 7 + (-1) + 3 + (-9) + (-5) + (-4) + 6 + 5 + (-2) + 6 + 0}{12}$$

$$\Rightarrow \bar{x} = 14 + \frac{-4}{12} = 14 - \frac{1}{3}$$

$$\Rightarrow \bar{x} = \frac{41}{3}$$

Yes, we get same result in both cases !

This shows that, actual mean doesn't depend on assumed mean !

Q. 10. Arithmetic mean of marks (out of 25) scored by 10 students was 15. One of the student, named Karishma enquired the other 9 students and find the deviations from her marks are noted as − 8, − 6, − 3, − 1, 0, 2, 3, 4, 6. Find Karishma's marks.

Answer : Let Karishma got 'a' marks.

And assumed mean be 'a'.

We know,

$$\text{Arithmetic mean, } \bar{x} = a + \frac{\text{Sum of deviations}}{\text{No of deviations}}$$

Where, a is assumed mean.

As, deviations given are -8, -6, -3, -1, 0, 2, 3, 4, 6

Sum of deviations = -8 + (-6) + (-3) + (-1) + 0 + 2 + 3 + 4 + 6

= -3

As, arithmetic mean of marks is 15

Putting values in formula, we have,

$$15 = a + \frac{-3}{10}$$

⇒ 15 = a - 0.3

⇒ a = 15.3

⇒ Karishma got 15.3 marks

Q. 11. The sum of deviations of 'n' observations from 25 is 25 and sum of deviations of the same 'n' observations from 35 is − 25. Find the mean of the observations.

Answer : Given, no of observations = n

And sum of deviation from 25 is 25 and sum of deviation from 35 is -25.

Let the actual mean be x,

We know that

$$\text{Arithmetic mean, } \bar{x} = a + \frac{\text{Sum of deviations}}{\text{No of deviations}}$$

Where, a is assumed mean.

In first case, where assumed mean, a = 25 and sum of deviation is 25, Putting values in formula

We have,

$$x = 25 + \left(\frac{25}{n}\right) [1]$$

In first case, where assumed mean, a = 35 and sum of deviation is -25, Putting values in formula

We have,

$$x = 35 + \left(\frac{-25}{n}\right) [2]$$

Adding [1] and [2], we get

$$x + x = 25 + \frac{25}{n} + 35 - \frac{25}{n}$$

⇒ 2x = 60

⇒ x = 30

⇒ Arithmetic mean of required data is 30.

Q. 12. Find the median of the data: 3.3, 3.5, 3.1, 3.7, 3.2, 3.8

Answer : For finding median, first we arrange data either in ascending or descending order,

3.1, 3.2, 3.3, 3.5, 3.7, 3.8

No of terms (n) = 6

As, n is even

$$\text{Median is arithmetic mean of } \left(\frac{n}{2}\right)^{th} \text{ term and } \left(\frac{n}{2}+1\right)^{th} \text{ term.}$$

$$\Rightarrow \text{Median is arithmetic mean of } 3^{rd} \text{ and } 4^{th} \text{ term.}$$

$$\Rightarrow \text{Median} = \frac{3.3 + 3.5}{2} = \frac{6.8}{2}$$

⇒ Median = 3.4

Q. 13. The median of the following observations, arranged in ascending order is 15.

10, 12, 14, x − 3, x, x + 2, 25. Then find x.

Answer : Given, median = 15

As the terms are in ascending order, and

No of terms, n = 7

As, n is odd

Median is $\left(\frac{n+1}{2}\right)^{th}$ term.

⇒ Median is 4^{th} term

⇒ Median = x - 3

⇒ 15 = x - 3

⇒ x = 18

Hence, value of x is 18.

Q. 14. Find the mode of 10, 12, 11, 10, 15, 20, 19, 21, 11, 9, 10.

Answer : As, mode is the most frequently occurring value.

Clearly, 10 is most frequent

Therefore, mode is 10.

Q. 15. Mode of certain scores is x. If each score is decreased by 3, then find the mode of the new series.

Answer : As, mode is the most frequently occurring value.

'x' is most frequent score, now if each score is decreased by 3.

Each 'x' in scores will also be decreased by 3.

And mode will be (x - 3).

Q. 16. Find the mode of all digits used in writing the natural numbers from 1 to 100.

Answer : From 1 to 100,

digit	Frequency of occurring
0	11
1	21
2	20
3	20
4	20
5	20
6	20
7	20
8	20
9	20

As, mode is the most frequent occurring value.

Mode of above data is 1, as 1 occurs 21 times.

Q. 17. Observations of a raw data are 5, 28, 15, 10, 15, 8, 24. Add four more numbers so that mean and median of the data remain the same, but mode increases by 1.

Answer : Given, data is 5, 28, 15, 10, 15, 8, 24

No of terms,

We know,

Arithmetic mean of x_1, x_2, x_3, …, x_n (n observations) is

$$\bar{x} = \frac{x_1 + x_2 + x_3 + \cdots + x_n}{n}$$

Therefore, mean of above data

$$\bar{x} = \frac{5 + 28 + 15 + 10 + 15 + 8 + 24}{7}$$

$$\bar{x} = \frac{105}{7} = 15$$

For finding median, let's arrange data in increasing order

5, 8, 10, 15, 15, 24, 28

As, n is even

Median is $\left(\frac{n+1}{2}\right)^{th}$ term.

⇒ Median is 4^{th} term

⇒ Median = 15

Also, mode is the most frequently occurring value.

Clearly, 15 occurs two times and is most frequent

Therefore, mode is 15.

Now, we have to add four terms to this data such that mean and median remains same, but mode increase by 1.

So, mode of new data = 16

But as 16 is mode, its frequency must be greater than frequency of 2 i.e. minimum 3.

So, we have three terms out of four as 16, 16 and 16.

Now, let 4^{th} term be 'x'.

New data,

5, 8, 10, 15, 15, 16, 16, 16, 24, 28, x

No of terms = 11

As, mean remains same, mean of above data = 15

By using formula, mean of above data

$$\bar{x} = \frac{5+8+10+15+15+16+16+16+24+28+x}{11}$$

$$\Rightarrow 15 = \frac{153+x}{11}$$

⇒ 165 = 153 + x

⇒ x = 12

So, four terms are 12, 16, 16, 16.

Q. 18. If the mean of a set of observations $x_1, x_2, ..., ..., x_{10}$ is 20. Find the mean of $x_1 + 4, x_2 + 8, x_3 + 12, ..., x_{10} + 40$.

Answer : Given,

No of observations, n = 10

Mean, $\bar{x} = 20$

We know,

Arithmetic mean of $x_1, x_2, x_3, \ldots, x_n$ (n observations) is

$$\bar{x} = \frac{x_1 + x_2 + x_3 + \cdots + x_n}{n}$$

For given data,

$$20 = \frac{x_1 + x_2 + \cdots + x_{10}}{10}$$

⇒ $x_1 + x_2 + x_3 + \ldots + x_{10} = 200$ [1]

Now, to find the mean of

$x_1 + 4, x_2 + 8, \ldots, x_n + 40$

No of terms, n = 10

Mean using above formula,

$$\bar{x} = \frac{x_1 + 4 + x_2 + 8 + \cdots + x_{10} + 40}{10}$$

$$\Rightarrow \bar{x} = \frac{(x_1 + x_2 + \cdots + x_{10}) + (4 + 8 + 12 + 16 + \cdots + 40)}{10}$$

$$\Rightarrow \bar{x} = \frac{200 + 226}{10}$$

$$\Rightarrow \bar{x} = \frac{426}{10}$$

$$\Rightarrow \bar{x} = 42.6$$

Hence, mean of new data is 42.6

Q. 19. Six numbers from a list of nine integers are 7, 8, 3, 5, 9 and 5. Find the largest possible value of the median of all nine numbers in this list.

Answer : No of terms, n = 9

As, n is odd

Median is $\left(\frac{n+1}{2}\right)^{th}$ term.

⇒ Median is 5^{th} term

Let's first arrange given no in ascending order.

3, 5, 5, 7, 8, 9

Clearly, 9 is not possible as it is already at 6^{th} place and adding any term or terms can only shift its position ahead.

Also, 8 is possible if other three terms are greater than 8.

Therefore, 8 is the largest value possible.

Q. 20. The median of a set of 9 distinct observations is 20. If each of the largest 4 observations of the set is increased by 2, find the median of the resulting set.

Answer : No of terms, n = 9

As, n is odd

Median is $\left(\frac{n+1}{2}\right)^{th}$ term.

⇒ Median is 5^{th} term

If each of the largest 4 observations of set is increased by 2, it does not affect 5^{th} term or the order of terms.

Therefore, median remains same i.e. 20.

Exercise 7.2

Q. 1. Given below are the ages of 45 people in a colony.

33 8 7 25 31 26 5 50 25 48 56
33 28 22 15 62 59 16 14 19 24 35
26 9 12 46 15 42 63 32 5 22 11
42 23 52 48 62 10 24 43 51 37 48
36
Construct grouped frequency distribution for the given data with 6 class intervals.

Answer :

Age group	Tally Marks	Frequency
5-14	𝍸 ||||	9
15-24	𝍸 ||||	9
25-34	𝍸 ||||	9
35-44	𝍸 |	6
45-54	𝍸 ||	7
55-64	𝍸	5
		Total = 45

Q. 2. Number of students in 30 class rooms in a school are given below. Construct a frequency distribution table for the data with a exclusive class interval of 4 (students).

25 30 24 18 21 24 32 34 22 20 22
32 40 28 30 22 26 31 34 15 38 28
20 16 15 20 24 30 25 18

Answer :

No of students	Tally Marks	Frequency
15-19	𝍸	5
19-23	𝍸 ||	7
23-27	𝍸 |	6
27-31	𝍸	5
31-35	𝍸	5
35-39	|	1
39-43	|	1
		Total = 30

Q. 3. Class intervals in a grouped frequency distribution are given as 4 – 11, 12 – 19, 20 – 27, 28 – 35, 36 – 43. Write the next two class intervals. (i) What is the length of each class interval? (ii) Write the class boundaries of all classes, (iii) What are the class marks of each class?

Answer : Next two class intervals 44 - 51 and 52 - 59.

(i) Length of class interval = difference b/w upper and lower limit = 7

(ii)

Class interval	Boundaries
4 - 11	3.5 - 11.5
12 - 19	11.5 - 19.5
20 - 27	19.5 - 27.5
28 - 35	27.5 - 35.5
36 - 43	35.5 - 43.5
44 - 51	43.5 - 51.5
52 - 59	51.5 - 59.5

(iii) We know,

$$\text{Class-mark} = \frac{\text{upper limit+lower limit}}{2}$$

Class Interval	Class mark
4 - 11	7.5
12 - 19	15.5
20 - 27	23.5
28 - 35	31.5
36 - 43	39.5
44 - 51	47.5
52 - 59	55.5

Q. 4. In the following grouped frequency distribution table class marks are given.

Class Marks	10	22	34	46	58	70
Frequency	6	14	20	21	9	5

(i) Construct class intervals of the data. (Exclusive class intervals)
(ii) Construct less than cumulative frequencies and
(iii) Construct greater than cumulative frequencies.

Answer : (i) As the difference between two consecutive class intervals is 12, we can evaluate the exclusive class intervals as,

Lower limit = class mark - 6

Upper limit = class mark + 6

Class Marks	Class interval
10	4 - 16
22	16 - 28
34	28 - 40
46	40 - 52
58	52 - 64
70	64 - 76

(ii)

Class mark	Frequency	Cumulative frequency ('less than' type)
10	6	6
22	14	20
34	20	40
46	21	61
58	9	70
70	5	75

(iii)

Class mark	Frequency	Cumulative frequency ('Greater than' type)
10	6	75
22	14	69
34	20	55
46	21	35
58	9	14
70	5	5

Q. 5. The marks obtained by 35 students in a test in statistics (out of 50) are as below.

35 1 15 35 45 23 31 40 21 13 15
20 47 48 42 34 43 45 33 37 11 13
27 18 12 37 39 38 16 13 18 5 41
47 43
Construct a frequency distribution table with equal class intervals, one of them being 10-20 (20 is not included).

Answer :

Marks intervals	Tally Marks	No of students (frequency)
0 - 10	||	2
10 - 20	𝍸 𝍸	10
20 - 30	||||	4
30 - 40	𝍸 ||||	9
40 - 50	𝍸 𝍸	10
		Total = 35

Q. 6. Construct the class boundaries of the following frequency distribution table. Also construct less than cumulative and greater than cumulative frequency tables.

Age	1-3	4-6	7-9	10-12	13-15
No of children	10	12	15	13	9

Answer :

Age	No of children	Class boundaries	Less than cumulative frequency	Greater than cumulative frequency
1-3	10	0.5-3.5	10	59
4-6	12	3.5-6.5	22	49
7-9	15	6.5-9.5	37	37
10-12	13	9.5-12.5	50	22
13-15	9	12.5-15.5	59	9

Q. 7. Cumulative frequency table is given below. Which type of cumulative frequency is given. Try to build the frequencies of respective class intervals.

Runs	0-10	10-20	20-30	30-40	40-50
No of cricketers 3	3	8	19	25	30

Answer :

Runs	less than cumulative frequency	Frequency
0-10	3	3
10-20	8	8 - 3 = 5
20-30	19	19 - 8 = 11
30-40	25	25 - 19 = 6
40-50	30	30 - 25 = 5

Q. 8. Number of readers in a library are given below. Write the frequency of respective classes. Also write the less than cumulative frequency table.

Number of books	1-10	11-20	21-30	31-40	41-50
Greater than Cumulative frequency	42	36	23	14	6

Answer :

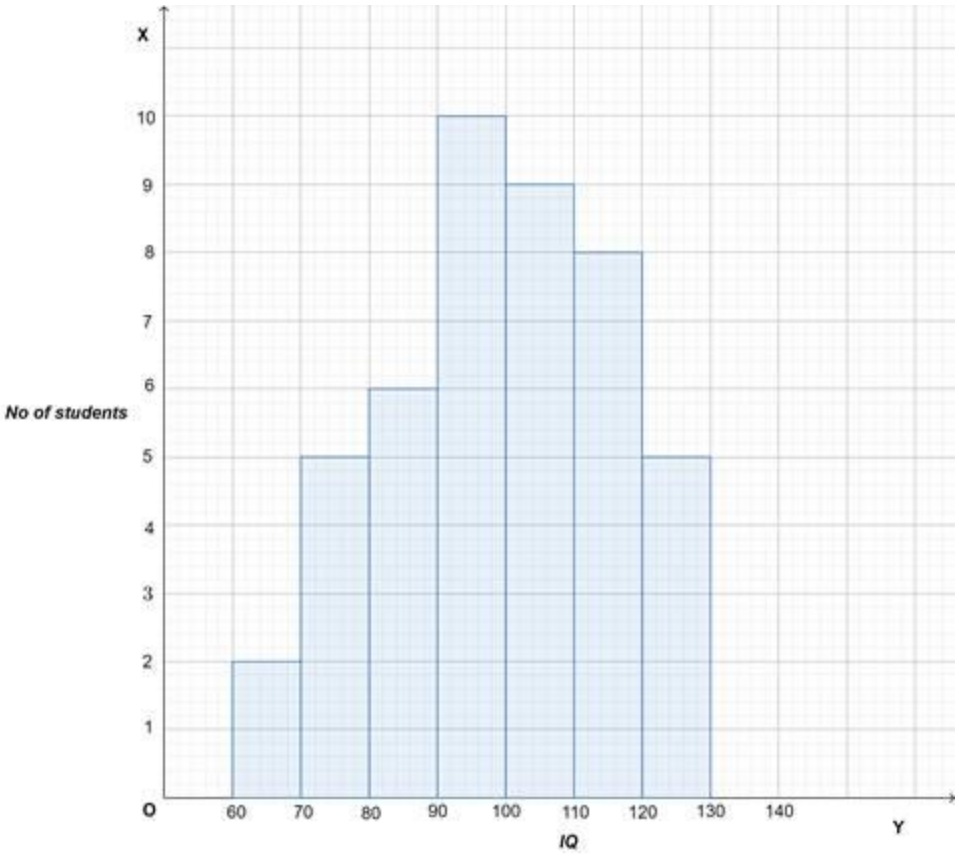
Number of books	Greater than cumulative frequency	Frequency	Less than cumulative frequency
1-10 11-20 21-30 31-40 41-50	42 36 23 14 6	42 - 36 = 6 36 - 23 = 13 23 - 14 = 9 14 - 6 = 8 6	6 19 28 36 42

Exercise 7.3

Q. 1. The following table gives the distribution of 45 students across the different levels of Intelligent Quotient. Draw the histogram for the data.

IQ	60-70	70-80	80-90	90-100	100-110	110-120	120-130
No of students	2	5	6	10	9	8	5

Answer :

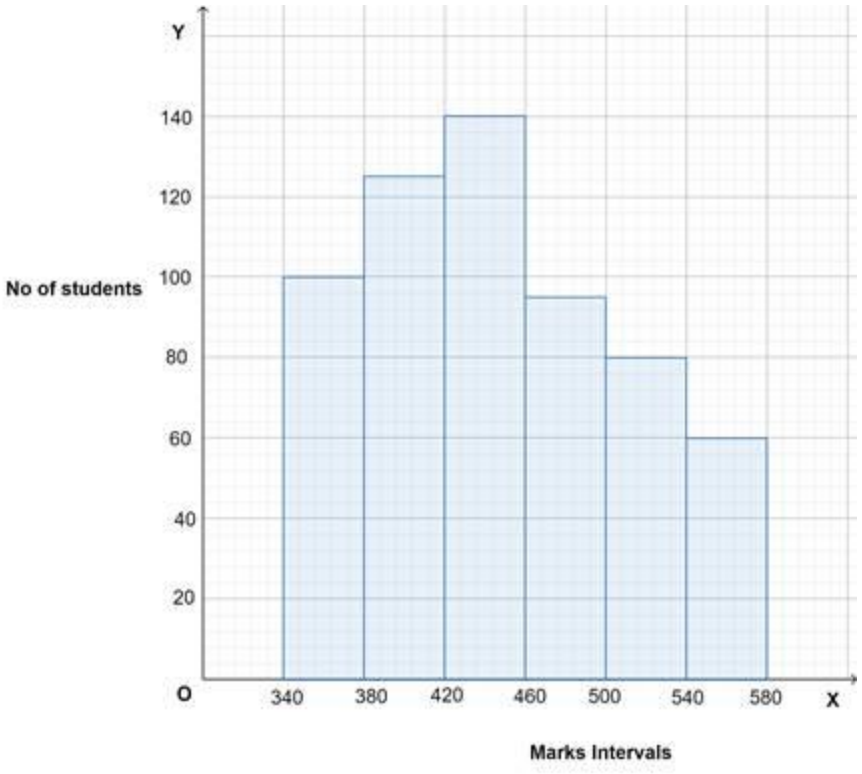


Q. 2. Construct a histogram for the marks obtained by 600 students in the VII class annual examinations.

Marks	360	400	440	480	520	560
No of students	100	125	140	95	80	60

Answer :

Marks	No of students	Class-interval
360	100	340-380
400	125	380-420
440	140	420-460
480	95	460-500
520	80	500-540
560	60	540-580

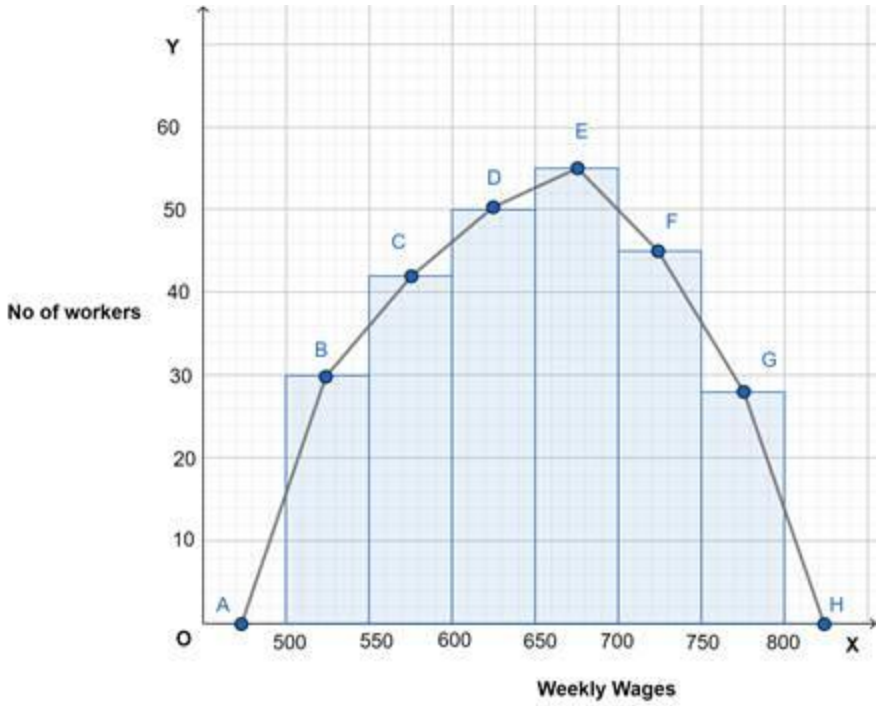


Q. 3. Weekly wages of 250 workers in a factory are given in the following table. Construct the histogram and frequency polygon on the same graph for the data given.

Weekly wage	500-550	550-600	600-650	650-700	700-750	750-800
No of workers	30	42	50	55	45	28

Answer :

Weekly Wages	Mid-point	No of workers
500-550	525	30
550-600	575	42
600-650	625	50
650-700	675	55
750-800	725	45
850-900	775	28



Q. 4. Ages of 60 teachers in primary schools of a Mandal are given in the following frequency distribution table. Construct the Frequency polygon and frequency curve for the data without using the histogram. (Use separate graph sheets)

Ages	24 – 28	28 – 32	32 – 36	36 – 40	40 – 44	44 – 48
No of teachers	12	10	15	9	8	6

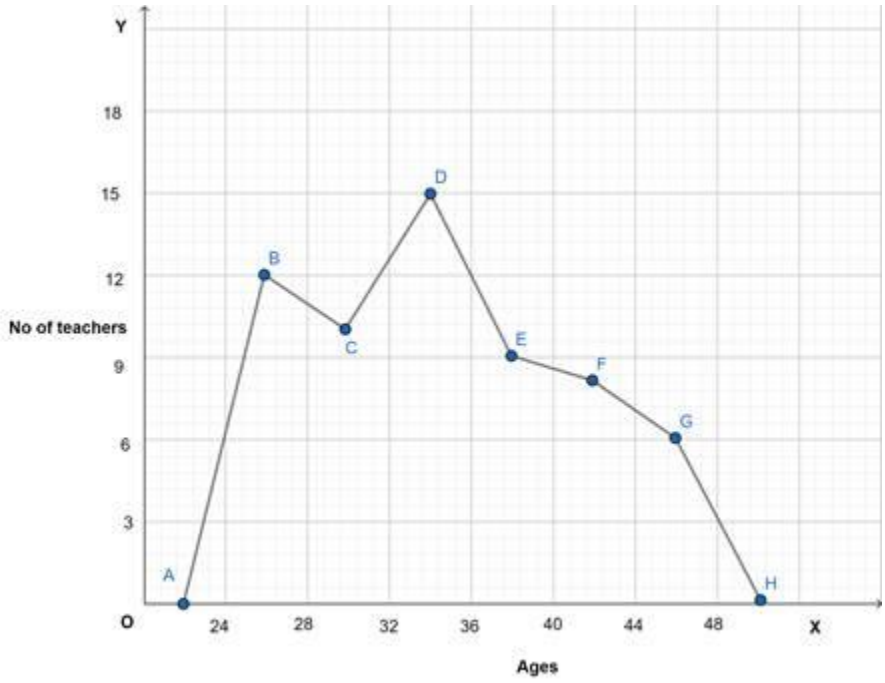
Answer : For above problem, let us first calculate class marks for each interval.

$$\text{Class mark} = \frac{\text{lower limit+upper limit}}{2}$$

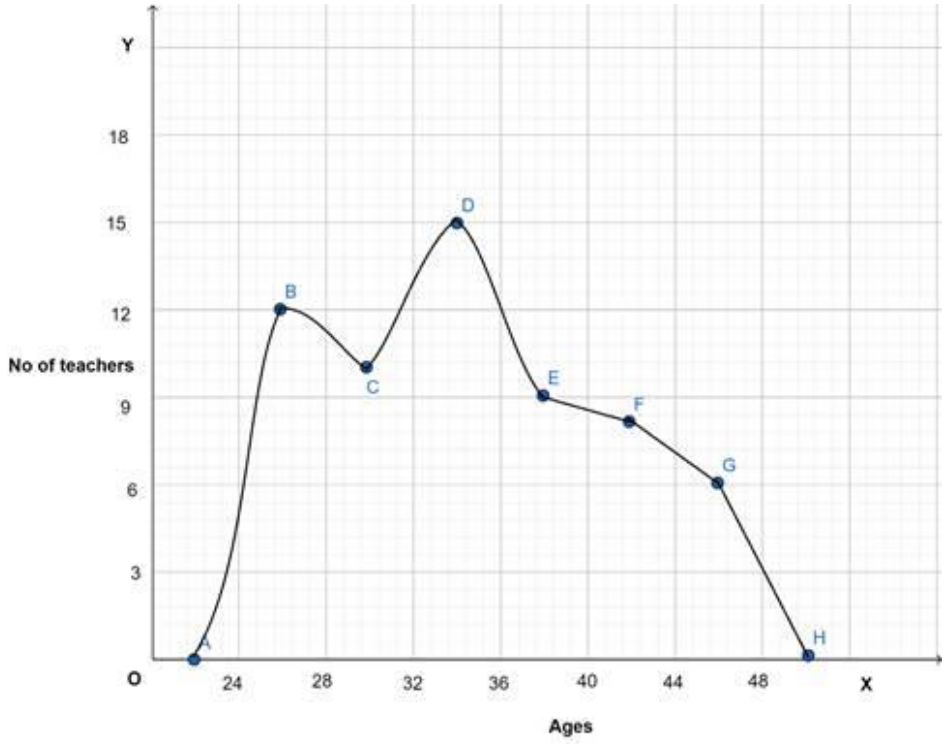
Ages	Class Marks	No of teachers (frequency)	Points
24-28	26	12	(26, 12)
28-32	30	10	(30, 10)
32-36	34	15	(34, 15)
36-40	38	9	(38, 9)
40-44	42	8	(42, 8)
44-48	46	6	(46, 6)

Now using points, we can make frequency curve and frequency polygon.

Frequency Polygon



Frequency Curve



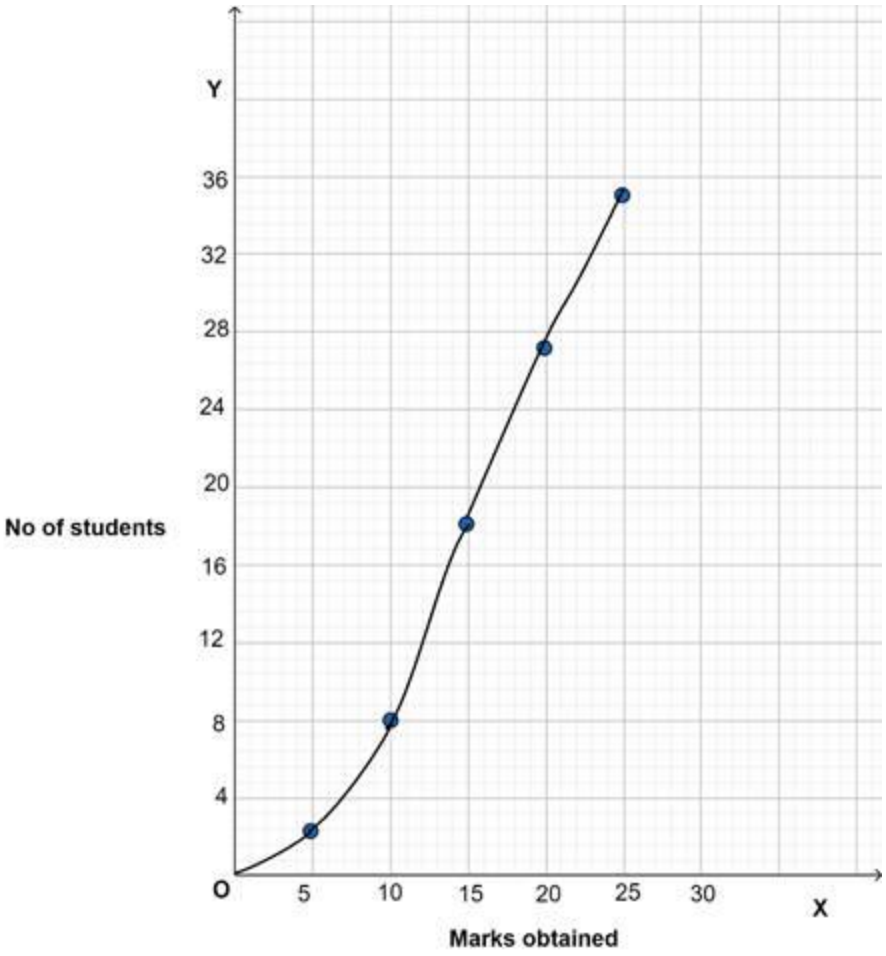
Q. 5. Construct class intervals and frequencies for the following distribution table. Also draw the ogive curves for the same.

Marks obtained	Less than 5	Less than 10	Less than 15	Less than 20	Less than 25
No of students	2	8	18	27	35

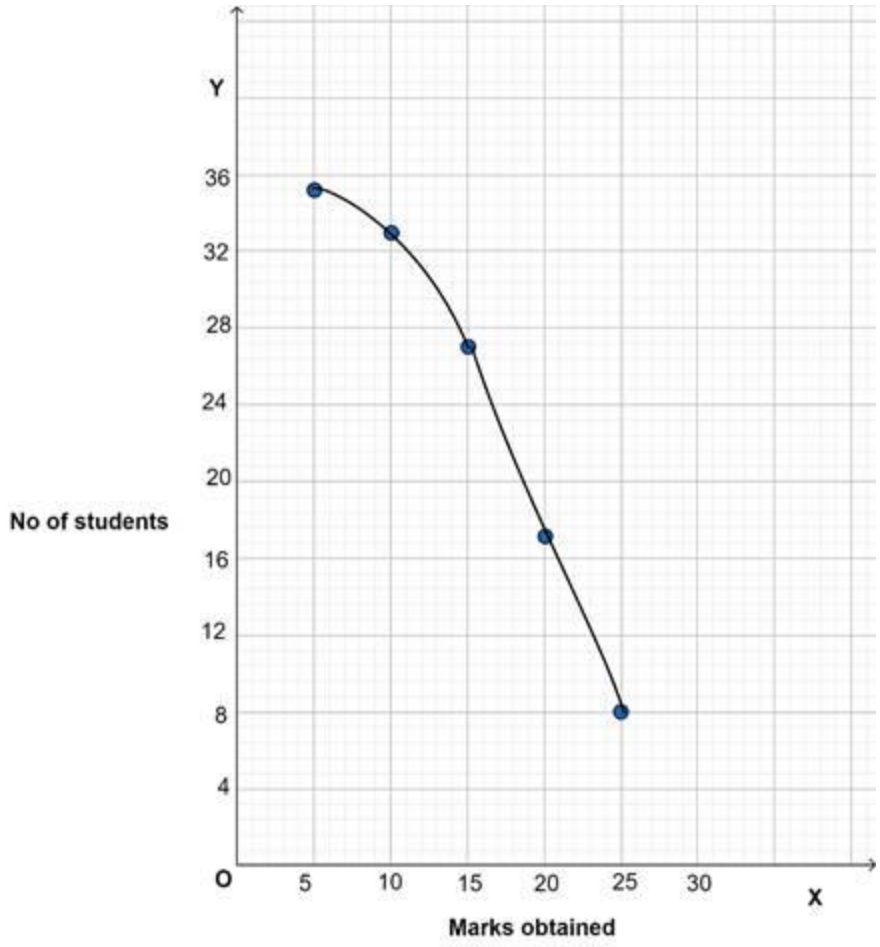
Answer :

Marks Obtained	Class intervals	Cumulative Frequency (less than)	Actual Frequency	Cumulative Frequency (more than)
Less than 5	0-5	2	2	35
Less than 10	5-10	8	8 - 2 = 6	33
Less than 15	10-15	18	18 - 8 = 10	27
Less than 20	15-20	27	27 - 18 = 9	17
Less than 25	20-25	35	35 - 27 = 8	8

Less than ogive



More than ogive


Y
36
32
28
24
20
16
12
8
4
O
5
10
15
20
25
30
X
No of students
Marks obtained