Topic

Median

Objective

To draw a cumulative frequency curve (or an Ogive) of more than type.

Previous Knowledge Required

1. Basic concepts of statistic.
2. Knowledge of cumulative frequency distribution.

Materials Required

1. Coloured chart paper
2. Geometry box
3. A pair of scissors
4. Fevicol/Glue stick
5. Graph paper
6. Sketch pens

Preparation/Presentation for activity

(i) Consider any given data as follows:

C.I.	5 – 10	10 – 15	15 – 20	20 – 25	25 – 30	30 – 35	35 – 40
Frequency	2	12	2	4	3	4	3

(ii) Form a cumulative frequency table of more than type of the above given data.

C.I.	Frequency	Cumulative Frequency More than type	
5 – 10	2	More than 5	30
10 – 15	12	More than 10	30 – 2 = 28
15 – 20	2	More than 15	28 – 12 = 16
20 – 25	4	More than 20	16 – 2 = 14
25 – 30	3	More than 25	14 – 4 = 10
30 – 35	4	More than 30	10 – 3 = 7
35 – 40	3	More than 35	7 – 4 = 3
Total	30		

(iii) Take a graph paper and paste it on a chart paper.

(iv) Take two perpendicular lines X′OX and Y′OY on the graph paper.

(v) Mark the lower limit of the class intervals on the horizontal axis and their corresponding values cumulative frequencies on the vertical axes.

(vi) Plot the points (5, 30), (10, 28), (15, 16), (20, 14), (25, 10), (30, 7) and (35, 3) on the graph paper.

(vii) Join the points by free hand smooth curve.

(viii) Since N = 30,

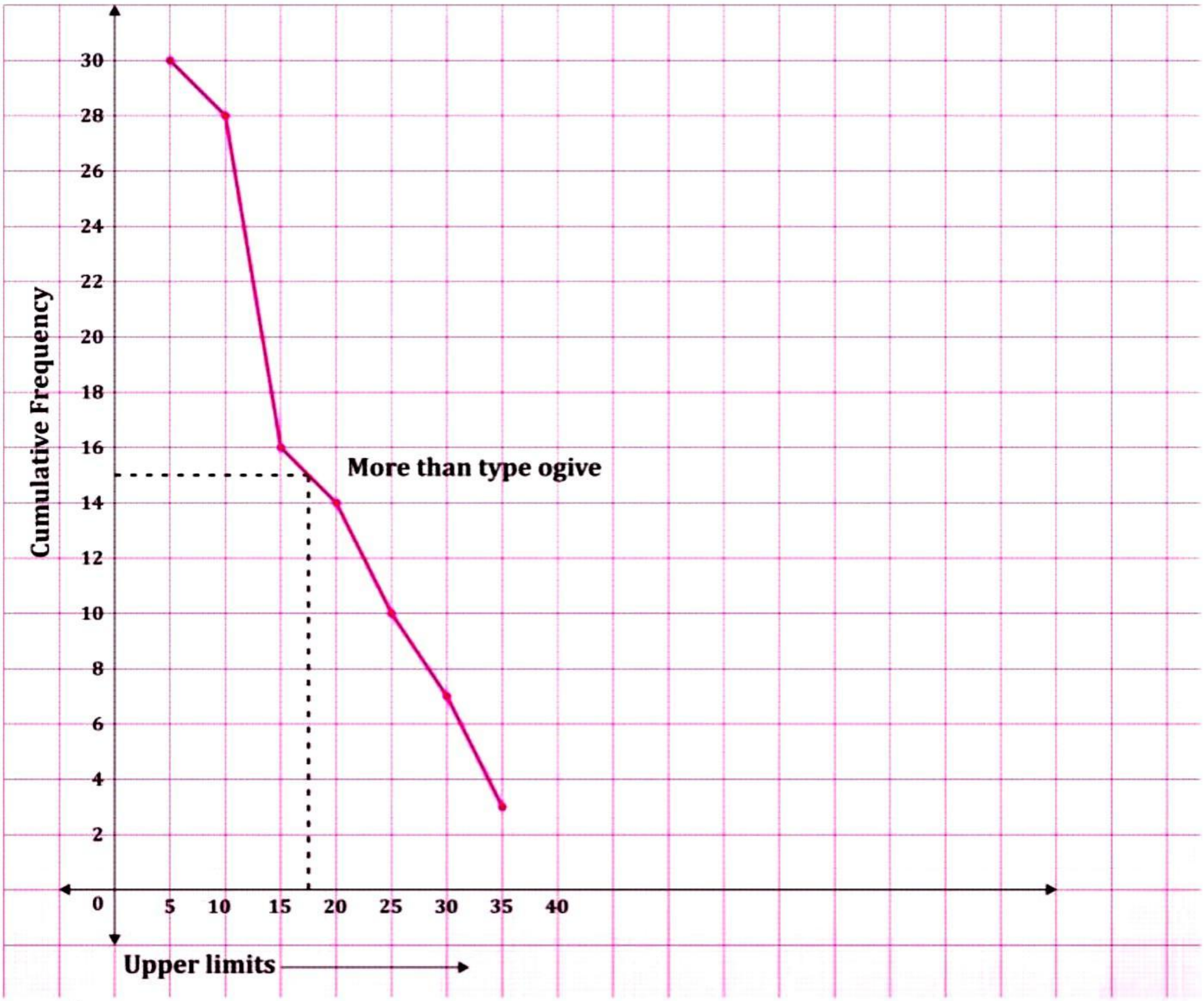
So, $\frac{N}{2} = \frac{30}{2} = 15$

(ix) Now, draw a line parallel to x-axis from the point got in the above step. Meeting the curve at P as shown.

(x) Draw perpendicular PM from P on the x-axis. The abscissa of M gives the median value.

(xi) The x-coordinate corresponding to M is 17.5.

Therefore, the required median on the graph is 17.5.



Result

Median of given data is 17.5.

VIVA VOCE

Q 1. What are the measures of central tendency?

Ans. The measures of central tendency are:
(i) Mean (ii) Median (iii) Mode

Q 2. Define cumulative frequency.

Ans. The cumulative frequency of a class is the frequency obtained by adding the frequencies of all the classes preceding the given class.

Q 3. What is the median in an arranged series of an even number of 2n terms?

Ans. Average of nth and $(n + 1)^{th}$ terms is the required median.

Q 4. How will you find the median of a grouped data graphically?

Ans: The median of grouped data can be obtained graphically as the x-coordinate of the point of intersection of the two ogives for the data.

Q 5. A data has 25 observations arranged in descending order. Which observation represent median?

Ans. 13^{th} observation

MULTIPLE CHOICE QUESTIONS

Q 1. In a set of data, the median is the value that separates the data into two equals:

(a) Halves (b) Quarters (c) Deciles (d) Percentiles

Q 2. The median is not affected by extreme values or outliers, making it a robust measure of:

(a) Mean (b) Range (c) Central tendency (d) Variance

Q 3. In a dataset with an odd number of observations, the median is the value located at the:

(a) Beginning (b) End (c) Middle (d) Average

Q 4. If a dataset is arranged in ascending order, the median corresponds to the value at the position of the:

(a) First quartile (b) Second quartile (c) Third quartile (d) Fourth quartile

Q 5. Which of the following statements about the median is true?

(a) It is affected by extreme values.
(b) It is always equal to the mean.
(c) It is a measure of variability.
(d) It is the middle value in a dataset when arranged in order.

Answer Key

1.(a)	2.(c)	3.(c)	4.(b)	5.(d)