Statistics

1 Marks Questions

1. Write three formulas to find the mean

Sol: Three formulas to find the mean:

i) The Direct Method: $\bar{x} = \frac{\sum fixi}{\sum fi}$

ii) The assumed mean Method: $\bar{x} = a + \frac{\sum fidi}{\sum fi}$

iii) The step deviation Method: $\bar{x} = a + \left[\frac{\sum fiui}{\sum fi}\right] \times h$

2. Find the mean for first 100 natural numbers.

Sol: First 100 natural numbers = 1, 2, 3, …….100

Sum of first n natural numbers $= \frac{n(n+1)}{2}$

Sum of first 100 natural numbers $= \frac{100(100+1)}{2}$

$$= \frac{100(101)}{2} = 50 \times 101$$

$\therefore$ Mean of first 100 natural numbers

$$= \frac{sum\ of\ observations}{No.of\ observations} = \frac{50 \times 101}{100}$$

$$= 50.5$$

3. Find the mean if $\sum f_i x_i = 1860$ and $\sum f_i = 30$.

Sol: $\sum f_i x_i = 1860$, $\sum f_i = 30$

Mean = $\frac{\sum fixi}{\sum fi} = \frac{1860}{30} = 62$

4. Find the mode of $\frac{1}{3},\frac{3}{4},\frac{5}{6},\frac{1}{2},\frac{7}{12}$

Sol: Given observations= $\frac{1}{3},\frac{3}{4},\frac{5}{6},\frac{1}{2},\frac{7}{12}$

$3\overline{)3,4,6,2,12}$

$2\overline{)1,4,2,2,4}$

$1,2,1,1,2$

No. of observations = 5

Sum of observations $=\frac{1}{3}+\frac{3}{4}+\frac{5}{6}+\frac{1}{2}+\frac{7}{12}$

$$\frac{108}{24}=\frac{9}{2}=4.5$$

5. Find mode if a = 47.5, $\sum f_i d_i$ = 435 and $\sum f_i$ = 30.

Sol: Given that: a = 47.5

$\sum f_i d_i$ = 435

$\sum f_i$ = 30

Mode $\bar{x}=a+\frac{\sum fidi}{\sum fi}$

$=47.5+\frac{435}{30}$

$=47.5+\frac{145}{10}$

= 47.5 + 14.5

= 62

6. Find the mode of first n natural numbers

Sol: first n natural numbers = 1, 2, 3, 4,…….. n.

In this series any number is not repeated so, there is no mode for this numbers

(**Note:** If there is no mode for any problem. We cannot say that the mode is ‘0’)

7. The wickets taken by a bowler in 10 cricket matches are as follows: 2, 6, 4, 5, 0, 2, 1, 3, 2, 3. Find the mode of the data.

Sol: Let us arrange the observations in order i.e. 0, 1, 2, 2, 2, 3, 4, 5, 6.

Clearly 2 is the number of wickets taken by the bowler in the maximum number of matches (i.e., 3 times). So, the mode of this data is 2.

8. Find the mode of given data 5, 6, 9, 10, 6, 12, 3, 6, 11, 10, 4, 6, 7

Sol: Given data: 5, 6, 9, 10, 6, 12, 3, 6, 11, 10, 4, 6, 7

$\therefore$ Ascending order: 3, 4, 5, 6, 6, 6, 6, 7, 9, 10, 10, 11, 12

$\therefore$ Mode = 6

9. Find the mode of given data 2, 2, 2, 3, 3, 3, 4, 4, 4, 5, 5, 5, 6, 6, 6

Sol: Given data 2, 2, 2, 3, 3, 3 4, 4, 4, 5, 5, 5, 6, 6, 6

Mode of given data = 2, 3, 4, 5 and 6.

10. Write the formula to find the median.

Sol: Median (M) $= l + \left[\dfrac{\frac{n}{2} - cf}{f}\right] \times h$

11. Find the median if, l = 60, cf = 22, f = 7, h = 10, and $\frac{n}{2} = 26.5$

Sol: Give that

$l = 60$

$cf = 22$

$f = 7$

$h = 10$

$\frac{n}{2} = 26.5$

Median (M) $= l + \left[\dfrac{\frac{n}{2} - cf}{f}\right] \times h$

$$= 60 + \left[\frac{26.5 - 22}{7}\right] \times 10$$

$$= 60 + \left[\frac{4.5}{7}\right] \times 10$$

$$= 60 + \frac{45}{70} \times 10$$

$$= 60 + \frac{45}{7}$$

$$= 60 + 6.4$$

$$= 66.4.$$

12. What are ogive curves?

Sol: cumulative frequency curve or an ogive:

First we prepare the cumulative frequency table, and then the cumulative frequencies are plotted against the upper or lower limits of the corresponding class intervals. By joining the points the curve so obtained is called a cumulative frequency or ogive.

2 Mark Questions

1. The marks obtained in mathematics by 30 students of class X of a certain school are given in table below. Find the mean of the marks obtained by the students.

Marks obtained (x_i)	**10**	**20**	**36**	**40**	**50**	**56**	**60**	**70**	**72**	**80**	**88**	**92**	**95**
No.of student (f_i)	**1**	**1**	**3**	**4**	**3**	**2**	**4**	**4**	**1**	**1**	**2**	**3**	**1**

Sol: let us re-organize this data and find the sum of all observations

Marks obtained (x_i)	Number of students (f_i)	f_ix_i
10	1	10
20	1	20
36	3	108
40	4	160
50	3	150
56	2	112
60	4	240
70	4	280
72	1	72
80	1	80
88	2	176
92	3	276
95	1	95
Total	$\sum f_i = 30$	$\sum f_ix_i = 1779$

So, $\bar{x} = \frac{\sum fixi}{\sum fi} = \frac{1779}{30} = 59.3$

$\therefore$ The mean marks are 59.3.

2. Write mean formula in deviation method? Explain letters in it.

Sol: mean $\bar{x} = a + \frac{\sum fiui}{\sum fi} \times h$

'a' is class mark of mean class

'fi' is the highest frequency

$\mu i = \frac{xi - a}{h}$, Here x_i = mid value of classes

a = assumed mid value

h = class size

$\sum f_i x_i$ = sum of total frequency.

3. A survey was conducted by a group of students as a part of their environment awareness progamme, in which they collected the following data regarding the number of plants in 20 houses in a locality. Find the mean number of plants per house.

Number of plants	0 – 2	2 – 4	4 – 6	6 – 8	8 – 10	10 – 12	12 – 14
Number of house	1	2	1	5	6	2	3

No. of plants	No. of houses f_i	Class marks x_i	$f_i x_i$
0 – 2	1	1	1
2 – 4	2	3	6
4 – 6	1	5	5
6 – 8	5	7	35
8 – 10	6	9	54

10 – 12	2	11	22
12 – 14	3	13	39
Total	$\sum f_i = 20$		$\sum f_i x_i = 162$

$$\text{Mean} = \frac{\sum fixi}{\sum fi}$$

$$= \frac{162}{20}$$

$$= 8.1$$

$\therefore$ 8 plants are planted at each house.

4. The table below shows the daily expenditure on food of 25 households in a locality.

Daily expenditure (Rs)	**100 – 150**	**150 – 200**	**200 -250**	**250 – 300**	**300 – 350**
No. of house holds	**4**	**5**	**12**	**2**	**2**

Find the mean daily expenditure on food by a suitable method

Daily expenditure (in Rupees)	**No. of households (f_i)**	**Class Marks (x_i)**	$f_i x_i$
100 – 150	4	125	500
150 – 200	5	175	875
200 -250	12	225	2700
250 – 300	2	275	550
300 – 350	2	325	650
	$\sum f_i = 25$		$\sum f_i x_i = 5275$

$$\text{Mean} = \frac{\sum fixi}{\sum fi} = \frac{5275}{25} = 211$$

The mean daily expenditure on food of a house hold is Rs. 211.

5. Write the formula of mode in a grouped data and explain the letters in it.

Sol: Mode $= l + \left[\frac{f_1 - f_0}{2f_1 - f_0 - f_2}\right] \times h$

Where, l = lower boundary of the modal class

h = size of the modal class interval

f_1= frequency of the modal class

f_0 = frequency of the class preceding the modal class

f_2 = frequency of the class succeeding the modal class

6. Write the formula of median in a grouped data and explain the letters in it.

Sol: Median for a grouped data:

Median $= l + \left[\frac{\frac{n}{2} - cf}{f}\right] \times h$

Where, l = lower boundary of median class

n = number of observations

cf = cumulative frequency of class preceding the median class

f = frequency of median class

h = size of the median class

7. The mean of the following distribution is 53. Find the missing frequency p?

Classes	0 – 20	20 – 40	40 – 60	60 – 80	80 – 100
Frequency	12	15	32	P	13

Sol:

Class	**Class mark**	f_i	$f_i x_i$
0 – 20	10	12	120
20 – 40	30	15	450
40 – 60	50	32	1600

60 – 80	70	P	70p
80 – 100	90	13	1170
		$\sum f_i = 72 + p$	$\sum f_i x_i = 3340 + 70p$

mean $\bar{x} = \frac{\sum fixi}{\sum fi} \Rightarrow \frac{53}{1} = \frac{3340 + 70p}{72 + p}$

3340 + 70p = 53 (72 + p)

3340 + 70p = 3816 + 53p

70p – 53p = 3816 – 3340

17p = 476

$p = \frac{476}{17}$

P = 28.

8. Find the unknown entries a, b, c, d in the following distribution of heights of students in a class.

Height (in cm)	Frequency	Cumulative frequency
150 – 155	12	12
155 – 160	a	25
160 – 165	10	b
165 – 170	c	43
170 – 175	5	48
175 –180	2	d

a = 25 – 12 = 13 b = 25 + 10 = 35

c = 43 – 35 = 8 d = 48 + 2 = 50

9. Prepare less than cumulative frequency distribution and greater than cumulative frequency distribution for the following data.

Daily income (in rupees)	**250 – 300**	**300 – 350**	**350 – 400**	**400 – 450**	**450 – 500**
No. of workers	**12**	**14**	**8**	**6**	**10**

Sol: Less than cumulative frequency

Daily income (in Rs)	**No. of workers**	**Upper limits**	**Less than cumulative frequency**
250 – 300	12	300	12
300 – 350	14	350	12 + 14 = 26
350 – 400	8	400	12 + 14 + 8 = 34
400 – 450	6	450	12 + 14 + 8 + 6 = 40
450 – 500	10	500	12 + 14 +8 + 6 +10 = 50

Greater than cumulative frequency

Daily income (in Rs)	**No. of workers**	**lower limits**	**Greater than cumulative frequency**
250 – 300	12	250	12 + 14 + 8 + 6 + 10 = 50
380 – 350	14	300	14 + 8 + 6+10=40
350 – 400	8	350	8 + 6 + 10
400 – 450	6	400	6 + 10 = 16
450 – 500	10	450	10 = 10

10. Median of a data, arranged in ascending order 7, 10, 15, x, y, 27, 30 is 17 and when one more observation 50 is added to the data, the median has become 18 find x and y.

Sol: Given data:

7, 10, 15, x, y, 27, 30

$\therefore$ Median = x.

$\therefore$ x = 17 ($\because$ median = 17)

One more observation 50 is added then data is 7, 10, 15, x, y, 27, 30, 50.

$\therefore \text{Median} = \frac{x+y}{2}$

$18 = \frac{x+y}{2}$ [$\because$ median is 18]

x + y = 36

17 + y = 36 => y = 36 – 17 = 19

$\therefore$ x = 17, y = 19.

11. Prepare class interval frequency follow table.

Marks obtained	**Less than 10**	**Less than 20**	**Less than 30**	**Less than 40**	**Less than 25**
No. of students	**5**	**8**	**12**	**18**	**25**

Sol:

Marks obtained	**No. of students**	**Class in marks**	**Frequency**
Less than 10	5	0 – 10	5
Less than 20	8	10 – 20	8 – 5 = 3
Less than 30	12	20 – 30	12 – 8 = 4
Less than 40	18	30 – 40	18 – 12 = 6
Less than 50	25	40 – 50	25 – 18 = 7

12. In the calculation of mean problem, $\bar{x}$ = 62, $\sum f_i d_i$ = 435, a= 47.5 then what is the value of $\sum f_i$.

Sol: We know that, $\bar{x} = a + \frac{\sum fidi}{\sum fi}$

given, $\bar{x}$ = 62, $\sum f_i d_i$ = 435, a= 47.5, $\sum f_i$= ?

$$62 = 47.5 + \frac{435}{\sum fi}$$

$$62 - 47.5 = \frac{435}{\sum fi}$$

$$14.5 = \frac{435}{\sum fi}$$

$$\sum fi = \frac{435}{145}$$

$$= \frac{4350}{145}$$

f_i = 30.

4 Mark Questions

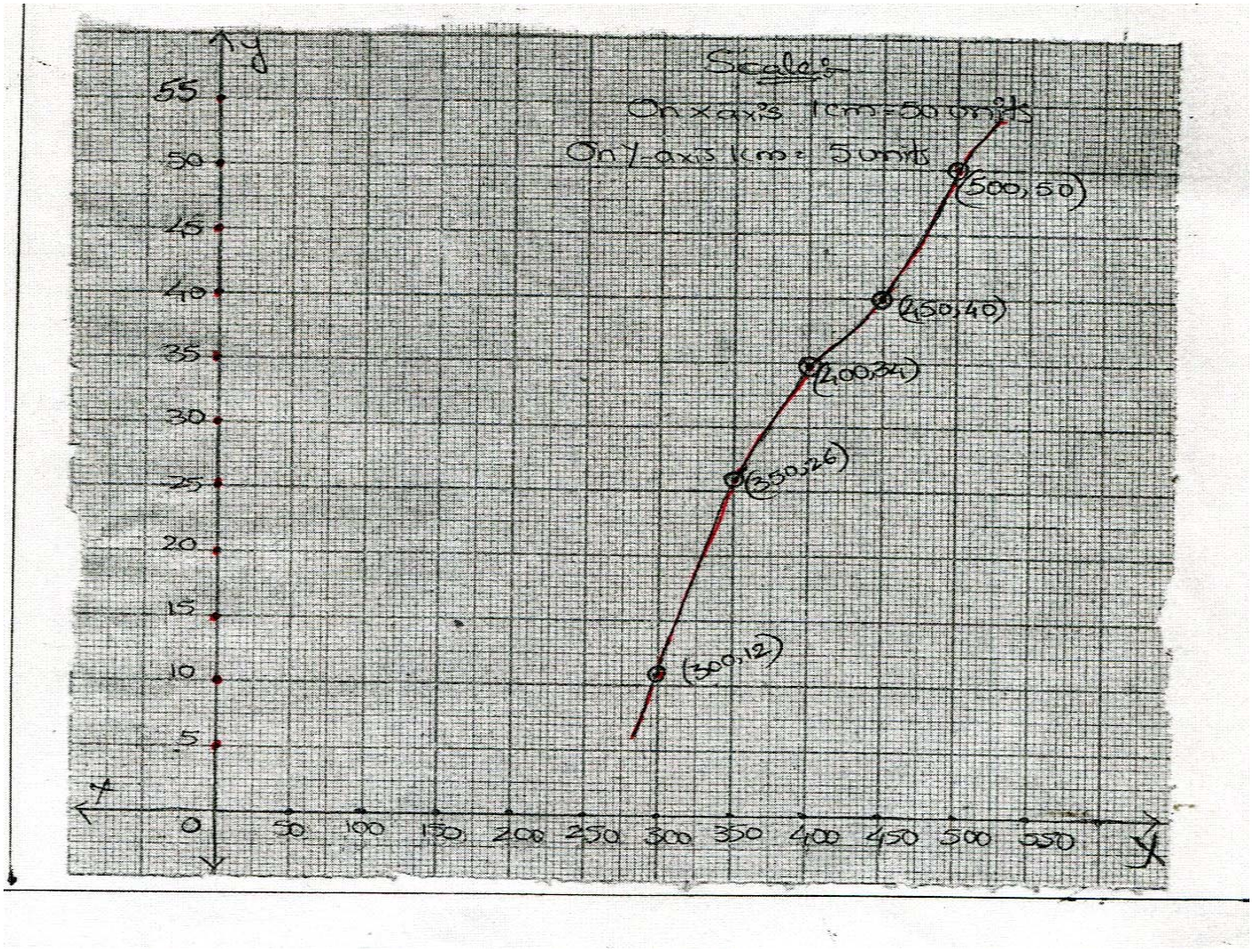
1. The following distribution gives the daily income of 50 workers of a factory.

Sol:

Daily income	250 – 300	300 – 350	350 – 400	400 – 450	450 – 500
No.of workers	12	14	8	6	10

Convert the distribution above to a less than type cumulative frequency distribution and draw it's ogive.

Class interval	f	cf	Points
Less than 300	12	12	(300, 12)
Less than 350	14	26	(350, 26)
Less than 400	8	34	(400, 34)
Less than 450	6	40	(450, 40)
Less than 500	10	50	(500, 50)



2. The following distribution shows the daily packet allowance of children of a locality. The mean pocket allowance is Rs.98. Find the missing frequency f.

Daily pocket allowance (in Rs)	11 – 13	13 – 15	15 – 17	17 – 19	19 – 21	21 – 23	23 – 25
No.of children	7	6	9	13	f	5	4

Sol:

Daily pocket allowance	No. of children (f_i)	Mid value of classes	$ui = \frac{xi - a}{n}$	$f_i u_i$
11 – 13	7	12	-3	-21
13 – 15	6	14	-2	-12
15 – 17	9	16	-1	-9
17 – 19	13	18(a)	0	0
19 – 21	f	20	1	f
21 – 23	5	22	2	10
23 – 25	4	24	3	12
	$\sum f_i = f + 44$			$\sum f_i u_{i=}$ -20 + f

Mean $\bar{x} = a + \frac{\sum fiui}{\sum fi} \times h$

Given mean $\bar{x}$ =18, ∑fiui = - 20 + f = f + 44, a = 18, h = 2.

$$18 = 18 + \frac{-20 + f}{f + 22} \times 2$$

$$\Rightarrow 18 = 18 + \frac{(-20 + f)}{f + 22} \times 2 \Rightarrow 0 = \frac{(-20 + f) \times 2}{f + 44}$$

$$\Rightarrow \frac{0}{2} = -20 + f$$

$\Rightarrow$ 0 = -20 + f

$\therefore$ f = 20.

3. Thirty women were examined in a hospital by a doctor and their of heart beat per minute were recorded and summarised as shown. Find the mean of heart beat per minute for these women, choosing a suitable method.

No. of heart beat/ minute	65 - 68	68 – 71	71 – 74	74 – 77	77 – 80	80 – 83	83 – 86
No. of women	2	4	3	8	7	4	2

Sol:

Let a=75.5

No. of heart beats/minute	No. of women f_i	Class marks (x_i)	$d_i = x_i - a$	$f_i d_i$
65 – 68	2	66.5	-9	-18
68 – 71	4	69.5	-6	-24
71 – 74	3	72.5	-3	-9
74 – 77	8	75.5=a	0	0
77 – 80	7	78.5	3	21
80 – 83	4	81.5	6	24
83 – 86	2	84.5	9	18
	$\Sigma f_i = 30$			$\Sigma f_i d_i = 12$

$$\bar{x} = a + \frac{\Sigma fidi}{\Sigma fi} = 75.5 + \frac{12}{30}$$

$\Rightarrow 75.5 + 0.4$

$\Rightarrow 75.9.$

4. In a retail market, fruit vendors were selling oranges kept in packing baskets. These baskets contained varying number of oranges. The following was the distribution of oranges.

No. of Oranges	10 – 14	15 – 19	20 – 24	25 – 29	30 – 34
No. of baskets	15	110	135	115	25

Find the mean number of oranges kept in each basket, which method of finding the mean did you choose?

Sol:

No.of oranges (C.I)	Number of baskets (f_i)	x_i	$ui = \frac{xi - a}{h}$ h = 5x	f_iu_i
10 -14	15	12	-2	-30
15 – 19	110	17	-1	-110
20 – 24	135	22=a	0	0
25 – 29	115	27	1	115
30 – 34	25	32	2	50
	$\Sigma f_i = 400$			Σf_iu_i =25

Here we use step deviation method where a =22, h = 5,

$$\bar{x} = a + \left[\frac{\Sigma fiui}{\Sigma fi}\right] \times h$$

$$= 22 + \frac{25}{400} \times 5$$

= 22 + 0.31

= 22.31.

5. The following table gives the literacy rate (in%) of 35 cities. Find the mean literacy rate.

Literacy rate in %	**45 – 55**	**55 – 65**	**65 – 75**	**75 – 85**	**85 – 95**
No.of cities	**3**	**10**	**11**	**8**	**3**

Sol:

Literacy rate	Number of cities (f_i)	Class marks (x_i)	$ui = \frac{xi - a}{h}$	f_iu_i
45 – 55	3	50	-2	-6
55 – 65	10	60	-1	-10
65 – 75	11	70a	0	0
75 – 85	8	80	1	8
85 – 95	3	90	2	6
	$\sum f_i = 35$			$\sum f_iu_i$ =-2

a = 70, h = 10

$$\therefore \bar{x} = a + \frac{\sum fiui}{\sum fi} \times h$$

$$\Rightarrow \bar{x} = 70 - \frac{2}{35} \times 10$$

$$\Rightarrow 70 - \frac{2}{35}$$

$\Rightarrow$ 70 - 0.57142

$\Rightarrow$ 69.4285 $\cong$ 69.43%.

6. The following data gives the information on the observed life times (in hours) of 225 electrical components.

Life time (in)	0 – 20	20 – 40	40 – 60	60 – 80	80 – 100	100 – 120
Frequency	10	35	52	61	33	29

Determine the modal life times of the components.

Class interval	Frequency
0 – 20	10
20 – 40	35
40 – 60	52
60 – 80	61
80 – 100	38
100 – 120	29

$\therefore$ The maximum frequency 61 is in the class 60 – 80 is the required modal class.

Modal class frequency $= f_1 = 61$.

Frequency of the class preceeding the modal class $f_0 = 52$

Frequency of the class succeeding the modal class $f_2 = 38$.

Lower boundary of the model class $l = 60$

Height of the class $h = 20$

$$\text{Mode (z)} = l + \frac{(f_1 - f_0)}{2f_1 - (f_0 + f_2)} \times h$$

$$= 60 + \left[\frac{61 - 52}{2 \times 61 - (52 + 38)}\right] \times 20$$

$$\Rightarrow 60 + \left[\frac{9}{122 - 90}\right] \times 20$$

$\Rightarrow 60 + \frac{9}{32} \times 20$

= 60 + 5.625

= 65.625 hour.

7. The given distribution shows the number of runs scored by some top batsmen of the world in one day international cricket matches

Runs	**3000 – 4000**	**4000 – 5000**	**5000 - 6000**	**6000 – 7000**	**7000 – 8000**	**8000 – 9000**	**9000 – 10,000**	**10,000 – 11,000**
No.of batsmen	**4**	**18**	**9**	**7**	**6**	**3**	**1**	**1**

Sol: Find the mode of the data.

Class interval	Frequency
3000 – 4000	4
4000 – 5000	18
5000 – 6000	9
6000 – 7000	7
7000 – 8000	6
8000 – 9000	3
9000 – 10,000	1
10,000 – 11,000	1

Maximum number of batsmen is in the class 4000 – 5000.

$\therefore$ Modal class is 4000 – 5000

Frequency of the modal class = f_1= 18

Lower boundary of the modal class l = 4000

Frequency of the model class, preceding f_0 = 4

Frequency of the class succeeding the modal class $f_2 = 9$

Height of the class, h = 1000.

Mode (z) $= l + \left[\frac{f_1 - f_0}{(f_1 - f_0) + (f_1 - f_2)}\right] \times h$

Mode (z) $= 4000 + \frac{18-4}{(18-4)+(18-9)} \times 1000$

$\Rightarrow 4000 + \frac{14}{14+9} \times 1000$

$\Rightarrow 4000 + \frac{14000}{23} = 4000 + 608.695$

= 4608.69 = 4608.7 runs.

8. The median of 60 observations, given below is 28.5. Find the values of x and y.

Class interval	0 – 10	10 – 20	20 – 30	30 – 40	40 – 50	50 – 60
Frequency	5	x	20	15	y	5

Sol:

Class interval	Frequency	c.f
0 -10	5	5
10 – 20	x	5 +x
20 – 30	20	25 + x
30 – 40	15	40 + x
40 – 50	y	40 + x + y
50 – 60	5	45 + x + y

Median $= l + \left[\dfrac{\frac{n}{2} - cf}{f}\right] \times h$

It is given that $\sum f = n = 60$

So, $45 + x + y = 60$

$x + y = 60 - 45 = 15$

$\therefore x + y = 15 \rightarrow (1)$

The median is 28.5 which lies between 20 & 30

$\therefore$ Median class = 20 – 30

Lower boundary of the median class 'l' = 20.

$\frac{N}{2} = \frac{60}{2} = 30$

Cf. cumulative frequency = 5 + x, h = 10

Median $= l + \left[\dfrac{\frac{n}{2} - cf}{f}\right] \times h$

$\Rightarrow 28.5 = 20 + \dfrac{30 - 5 - x}{20} \times 10$

$\Rightarrow 28.5 = 20 + \dfrac{25 - x}{2}$

$\dfrac{25 - x}{2} = 28.5 - 20 = 8.5$

$25 - x = 2 \times 8.5$

$x = 23 - 17 = 8$

Also from (1) x + y = 15

$8 + y = 15$

$y = 7.$

$\therefore x = 8, y = 7.$

9. The following data the information on the observed life times (in hours) of 400 electrical components.

Life time	1500 – 2000	2000 – 2500	2500 – 3000	3000 - 3500	3500 – 4000	4000 – 4500	4500 – 5000
Frequency	14	56	60	86	74	62	48

Class internal	Frequency
1500 – 2000	14
2000 – 2500	70
2500 – 3000	130
3000 – 3500	261
3500 – 4000	290
4000 – 4500	352
4500 – 5000	400

$n = 400$

l = 3000

$$\frac{n}{2} = \frac{400}{2} = 200$$

$cf = 130$

$f = 86$

$h = 500$

$$\text{Median} = l + \left[\frac{\frac{n}{2} - cf}{f}\right] \times h$$

$$= 3000 + \frac{(200-130)}{86} \times 500$$

$$= 3000 + \frac{70 \times 500}{86}$$

$$= 3000 + \frac{35000}{86}$$

$$= 3000 + 406.97$$

$$= 3406.98$$

Life time median of the bulb = 3406.98 hr.

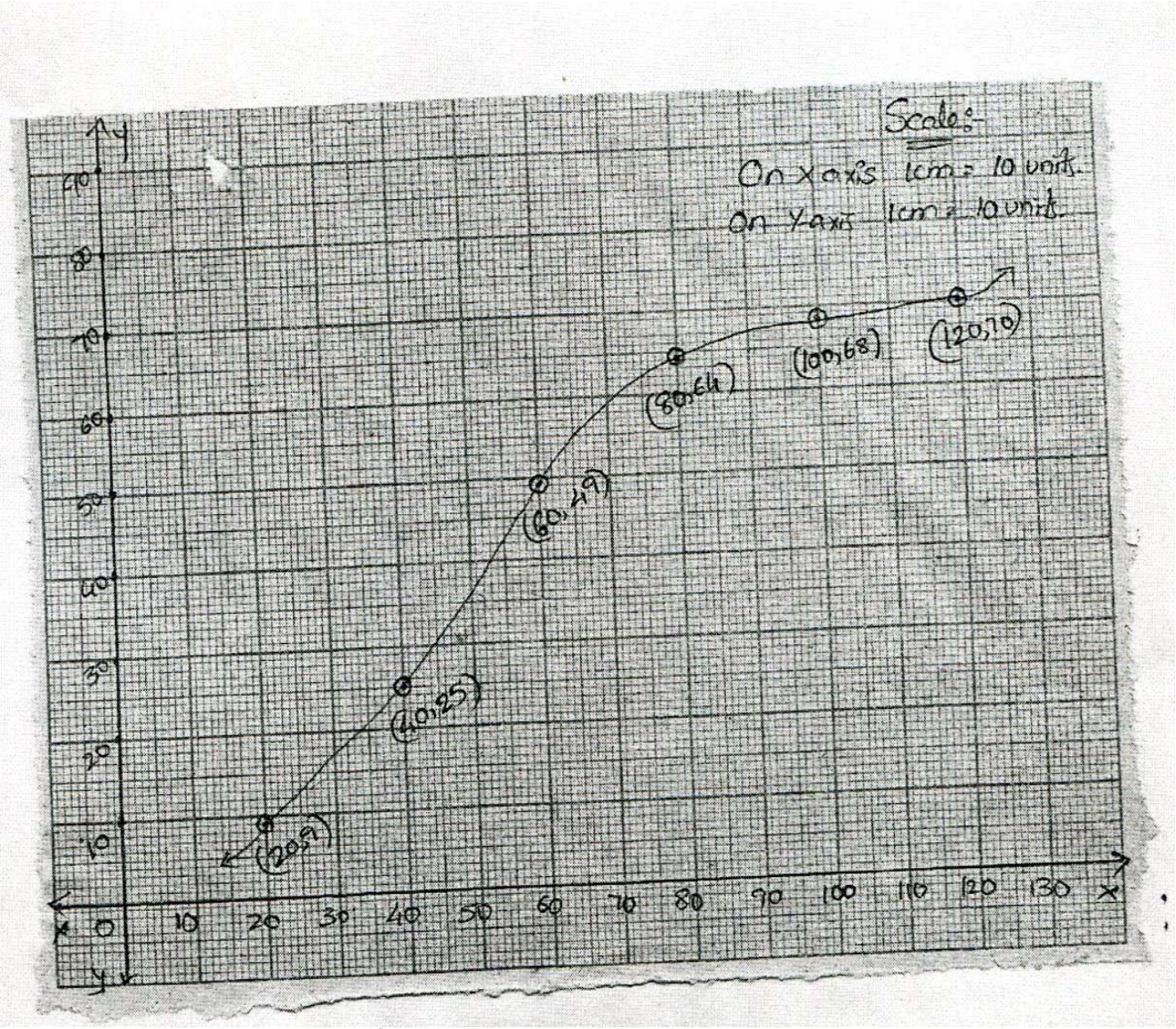
10. Draw "OGIVE CURVE" of the following frequency distribution table.

Classes	0 – 20	20 – 40	40 – 60	60 – 80	80 – 100	100 – 120
Frequency	9	16	24	15	4	2

Class	Frequency	L.C.F	U.B
0 – 20	9	9	20
20 – 40	16	9 + 16 =25	40
40 – 60	24	25 + 24 = 49	60
60 – 80	15	49 + 15 = 64	80
80 – 100	4	64 + 4 = 68	100
100 – 120	2	68 + 2 = 70	120

Let us draw a graph by considering upper boundary values on x – axis and L.C.F values on y-axis. The points to be located in the graph are

(20, 9), (40, 25), (60, 49), (80, 64), (100, 68), (120, 70).

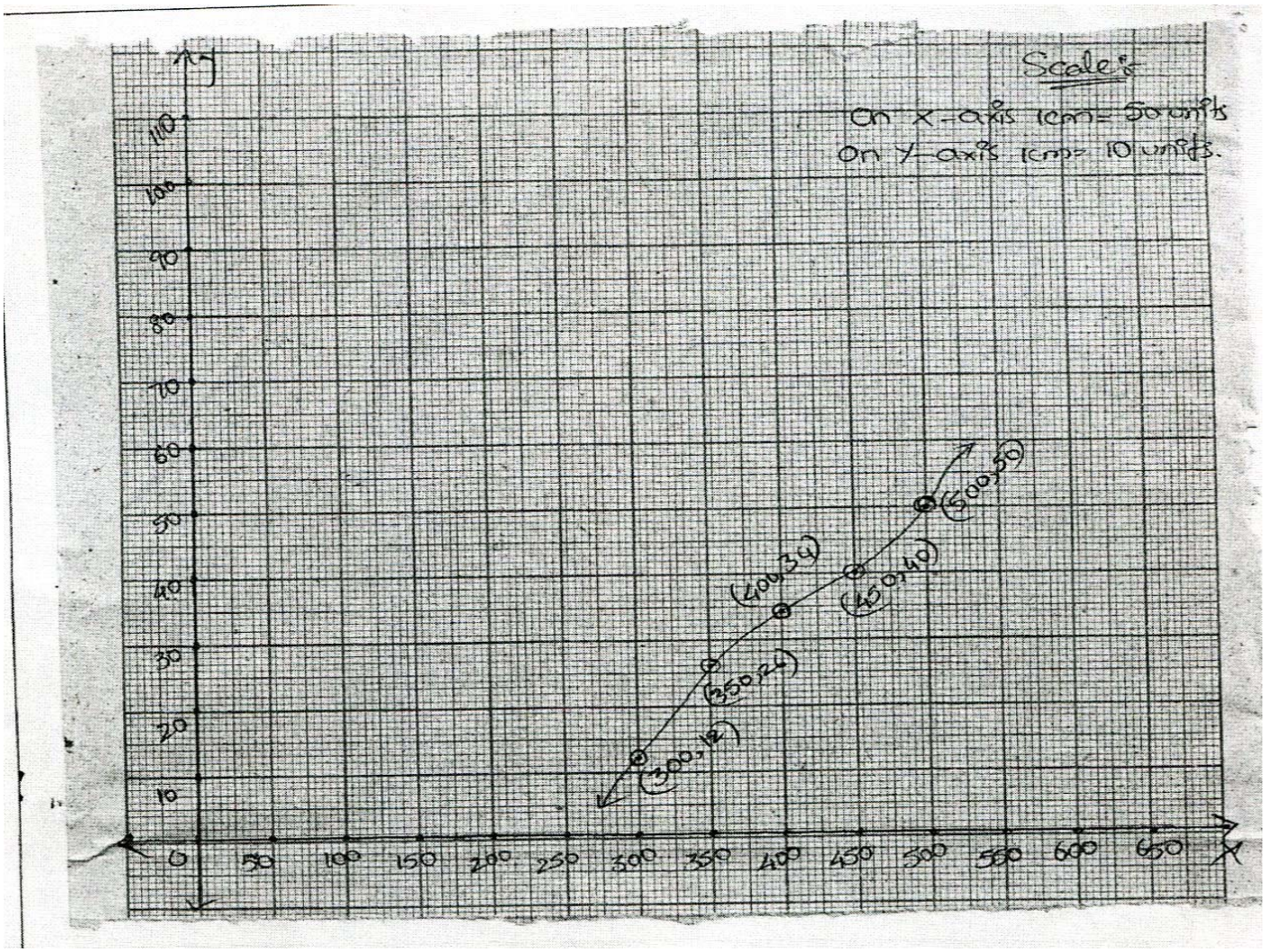


11. The following distribution gives the daily income of 50 workers of a factory.

Daily income	250 – 300	300 – 350	350 – 400	400 – 450	450 – 500
No. of workers	12	14	8	6	10

Convert the distribution above to a less than type cumulative frequency distribution, draw it's ogive.

Class interval	f	c.f	Point
Less than 300	12	12	(300, 12)
Less than 350	14	26	(350, 26)
Less than 400	8	34	(400, 34)
Less than 450	6	40	(450, 40)
Less than 500	10	50	(500, 50)

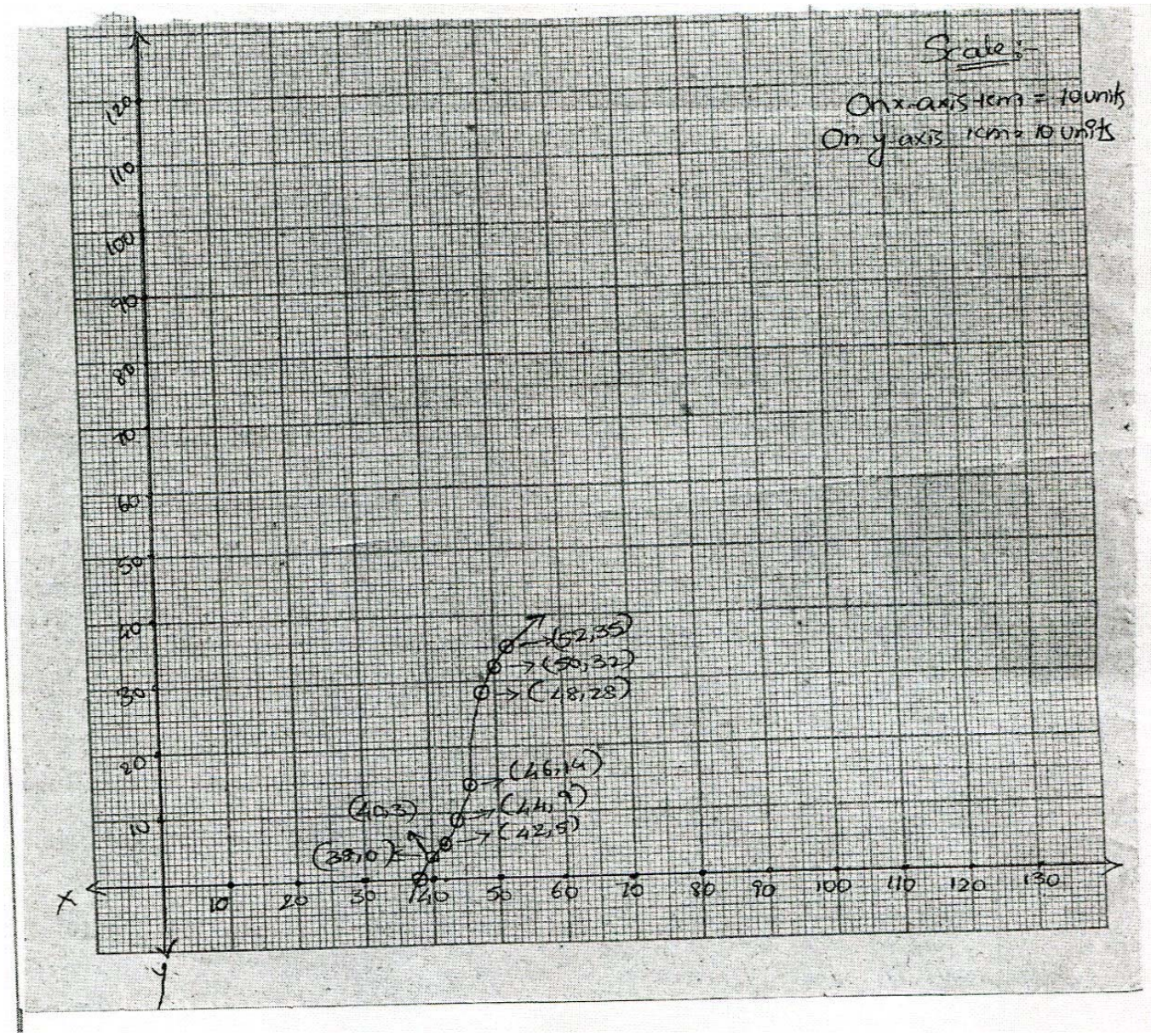


12. During the medical checkup of 35 students of a class, their weight were recorded as fallows?

Weight (in kg)	No. of students
Less than 38	0
Less than 40	3
Less than 42	5
Less than 44	9
Less than 46	14
Less than 48	28
Less than 50	32
Less than 52	35

Draw a less than type ogive for the given data. Hence obtain the median weight from the graph and verify the result by using the formula.

Given: Upper limits of the classes and less than cumulative frequencies. Therefore required points are (38, 0), (40, 3), (44, 9), (46, 14), (48, 28), (50, 32), & (52, 35).



13. The following table gives production yield per hectare of wheat of 100 farms of a village.

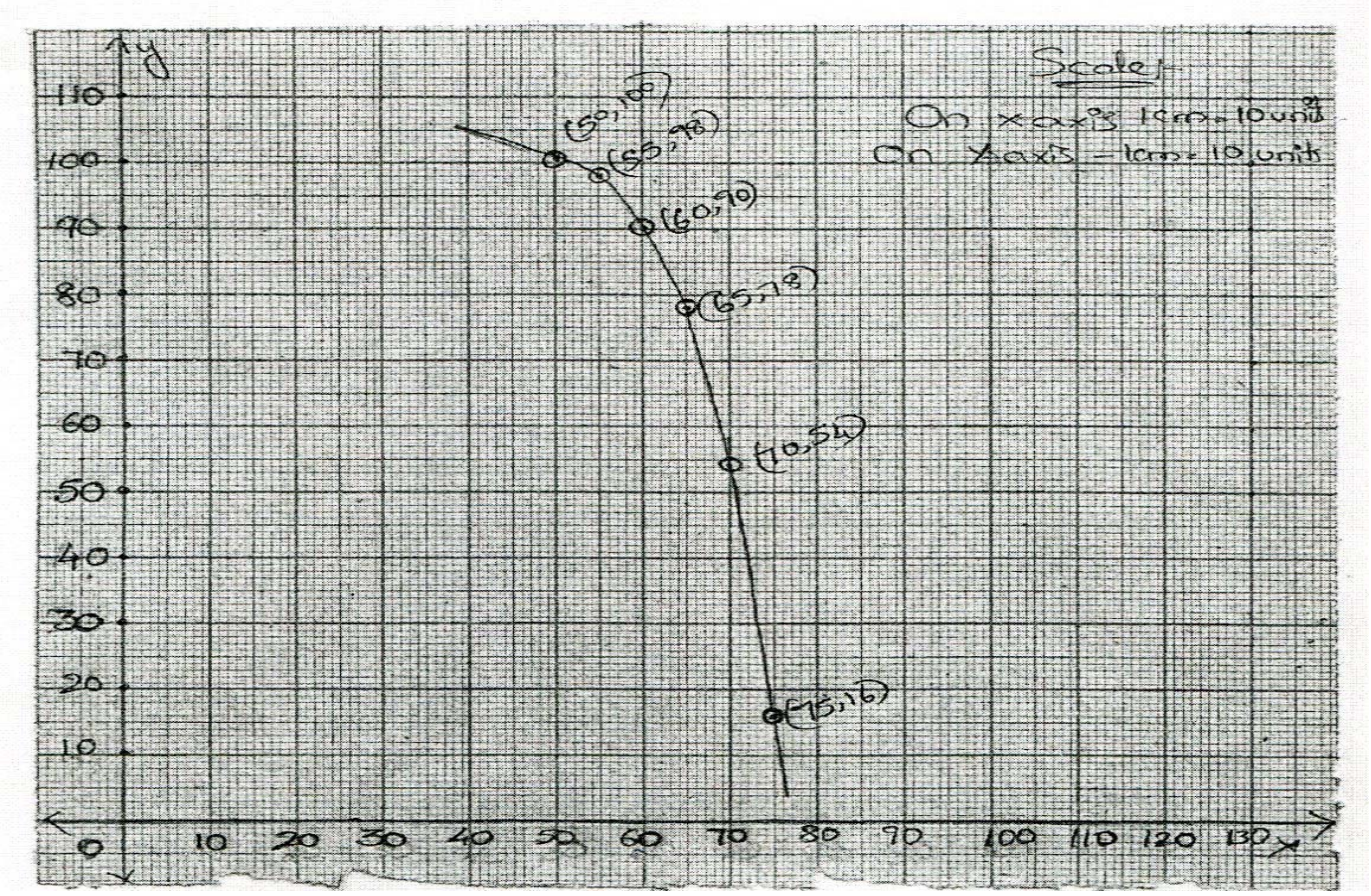
Production yield	50 – 55	55 – 60	60 – 65	65 – 70	70 – 75	75 – 80
No. of farmers	2	8	12	24	38	16

Change the distribution to a more than type distribution & draw its ogive. The given data is to be more than frequency distribution type.

Sol:

Production yield(Qui /Hec)	More than *cf*	No. of farmers	Points
More than 50	100	2	(50, 100)
More than 55	98	8	(55, 98)
More than 60	90	12	(60, 90)
More than 65	78	24	(65, 78)
More than 70	54	38	(70, 54)
More than 75	16	16	(75, 16)

A graph is plotted by taking the lower limits on the x – axis and respective of y –axis.



Multiple Choice Questions

1. The h indicates in mode $z = l + \left[\frac{f - f_0}{2f - f_0 - f_1}\right] \times h$ [ ]

   A) Frequency B) length of the CI

   C) Lower boundary of mode class D) mode

2. Mid values are used in calculating _____ [ ]

   A) A.M B) Median

   C) Mode D) None

3. Mean of 23, 24, 24, 22 and 20 is _____ [ ]

   A) 22.6 B) 16.2

   C) 18.9 D) 20.3

4. $\sum f_i x_i = 1390$, $\sum f_i = 35$, then mean $\bar{x} =$ _____ [ ]

   A) 39.71 B) 49.23

   C) 81.45 D) None

5. _____ is based on all observations _____ [ ]

   A) Median B) mean

   C) mode D) None

6. If the mode of the following data is 7, then the value of k in 6, 3, 5, 6, 7, 5, 8, 7, 6, 2k + 1, 9, 7, 13 is _____ [ ]

   A) 7 B) 8 C) 3 D) None

7. The data arranged in descending order has 25 observations which observation represents the median? [ ]

   A) 12th B) 13th

   C) 14th D) 15th

8. AM of $6, -4, \frac{2}{3}, 1\frac{1}{4}, \frac{-7}{6}$ is _____ [ ]

   A) 8.1 B) 5.3 C) 3.5 D) 0.55

9. Median of 17, 31, 12, 27, 15, 19 and 23 is _____ [ ]

A) 16 B) 20 C) 19 D) None

10. A.M of 12, 3…….. 10 is _____ [ ]

A) 3.2 B) 6.1 C) 3.5 D) 5.3

11. Range of 1, 2, 3, 4,…… n is_____ [ ]

A) n B) n – 1 C) n^2 D) $\frac{n}{2}$

12. For the given data with 50 observations "the less than ogive" and the more than ogive intersect at (15.5, 20). The median of the data is _____ [ ]

A) 11.5 B) 14.5 C) 15.5 D) 12

13. The mean of first n odd natural numbers is $\frac{n^2}{81}$ then n = _____ [ ]

A) 81 B) 18 C) 27 D) 54

14. A.M of 1, 2, 3,…… n is _____ [ ]

A) $\frac{n}{2}$ B) $\frac{n+1}{2}$ C) $\frac{n-1}{2}$ D) None

15. If the mean of 6, 7, x, 8, y, 14 is 9, then x = ____ [ ]

A) x + y = 21 B) x + y = 19

C) x – y = 19 D) x – y = 21

KEY

1) B; 2) A; 3) A; 4) A; 5) B;

6) C; 7) B; 8) D; 9) C; 10) D;

11) B; 12) C; 13) A; 14) B; 15) B.

Fill in the Blanks

1. The A.M of 30 students is 42. Among them two get zero marks then A.M of remaining students is _____

2.

Marks	10	20	30
No. of students	5	9	3

From the above data the value of median is _____

3. Data having one mode is called _____

4. A.M of 1, 2, 3 _____ n is _____

5. sum of all deviations taken from A.M is _____

6. Mode of A, B, C, D,…… Z is _____

7. Mean of first 5 prime numbers is _____

8. The observation of an ungrouped data in their ascending order are 12, 15, x, 19, 15 if the median of the data is 18 then x = _____

9. AM of a -2, a, a + 2 is _____

10. Median of 1, 2, 4, 5 is _____

11. Class mark of the class x – y is_____

12. L.C.F curve is drawn by using _____ and the corresponding cumulative frequency

13. The modal class for the following distribution is _____

x	Below 10	Below 20	Below 30	Below 40	Below 50	Below 60
f	-3	12	27	57	75	80

14. If the A.M of x, x + 3, x + 6, x + 9 and x + 12 is 10 then x = _____

15. If 35 is removed from the data 30, 34, 35, 36, 37, 38, 39, 40 then the median increases by _____

16. Range of first 10 whole numbers is _____

17. Construction of cumulative frequency table is useful in determining the _____

18. Exactly middle value of data is called _____

19. In the formula of mode

Mode = $= l + \frac{f_1 - f_0}{2f - f_0 - f_2} \times h$, f_0 represents _____

20. Median $= l + \frac{\frac{n}{2} - cf}{f} \times n$; '$l$' represents _____

21. The term 'ogive' is derived from [ ]

A) ogee B) ogie C) Ogeve D) Ogel

22. Range of the data 15, 26, 39, 41,11, 18, 7, 9 is _____ [ ]

A) 41 B) 39 C) 32 D) 34

23. The mean of first 'n' natural number is _____ [ ]

A) $\frac{2n+1}{2}$ B) $\frac{2n-1}{2}$ C) $\frac{n+1}{2}$ D) $\frac{n}{2}$

24. Median of first 'n' natural number is _____ [ ]

A) n B) $\frac{n}{2}$ C) $\frac{n}{2}+1$ D) $\frac{n+1}{2}$

Key:

1) 42; 2) 9; 3) unimodal data; 4) $\frac{n+1}{2}$; 5) 0; 6) no mode; 7) 5.6;

8) 18; 9) a; 10) 3; 11) $\frac{x+y}{2}$; 12) upper boundary; 13) 30 – 40; 14) 4; 15) 0.5;

16) 9; 17) Median; 18) median; 19) frequency of preceding of preceding model class;

20) lower limit of median; 21) A; 22)C; 23) C; 24) D.