Board – CBSE	Class – 7th	Topic – Collection and Organization of Data

Q.1 Find the mean of first five natural numbers.

Ans: First five natural numbers are 1, 2, 3, 4 and 5.

Mean of the first five natural numbers =

$$\frac{Sum\ of\ the\ given\ observations}{Number\ of\ given\ observations}$$

$$= \frac{1+2+3+4+5}{5} = \frac{15}{5} = 3$$

Hence, mean of the first five natural numbers is 3.

Q.2 Find the mean of first five prime numbers.

Ans: First five prime numbers are 2, 3, 5, 7 and 11.

$$Mean\ of\ the\ first\ five\ prime\ numbers = \frac{Sum\ of\ the\ given\ observations}{Number\ of\ the\ given\ observations}$$

$$= \frac{2+3+5+7+11}{5} = \frac{28}{5} = 5.6$$

Mean of the first five prime numbers is 5.6.

Q.3 Find the mean of first six multiples of 5.

Ans: First six multiples of 5 are 5, 10, 15, 20, 25 and 30.

$$Mean\ of\ the\ first\ six\ multiples\ of\ 5 = \frac{Sum\ of\ the\ given\ observations}{Number\ of\ the\ given\ observations}$$

$$= \frac{5+10+15+20+25+30}{6} = \frac{105}{6} = 17.5$$

Q.4 The following table shows the weights (in kg) of 15 workers in a factory: Calculate the mean weight.

Weight (in kg)	60	36	66	72	75
Number of workers	4	5	3	1	2

Ans:

Weight (in kg) (x_i)	Number of workers (f_i)	$(f_i \times x_i)$
60	4	240
63	5	315
66	3	198
72	1	72
75	2	150
	$\Sigma f_i = 15$	$\Sigma(f_i \times x_i) = 975$

$$Mean\ weight = \frac{\Sigma(f_1 \times x_1)}{\Sigma f_i} = \frac{975}{15} = 65\ kg$$

Q.5 The daily wages (in rupees) of 60 workers in a factory are given below: Find the mean daily wages.

Daily wages (in Rs)	140	150	160	180	190
Number of workers	14	16	15	7	8

Ans:

Daily wages (in Rs) (x_i)	Number of workers (f_i)	$(f_i \times x_i)$
140	14	1960
150	16	2400
160	15	2400
180	7	1260

190	8	1520
	$\Sigma f_i = 60$	$\Sigma(f_i \times x_i) = 9540$

$Mean\ daily\ wagest = \frac{\Sigma(f_1 \times x_1)}{\Sigma f_i} = \frac{9540}{60} = Rs\ 159$

Q.6 The ages (in years) of 50 players of a school are given below: Find the mean age.

Age (in years)	14	15	16	17	18
Number of players	15	14	10	8	3

Ans:

Age (in years) (x_i)	Number of players (f_i)	$(f_i \times x_i)$
14	15	210
15	14	210
16	10	160
17	8	136
18	3	54
	$\Sigma f_i = 50$	$\Sigma(f_i \times x_i) = 770$

$Mean\ daily\ wagest = \frac{\Sigma(f_1 \times x_1)}{\Sigma f_i} = \frac{770}{50} = 15.4\ years$

Q.7 Find the median of: 3, 11, 7, 2, 5, 9, 9, 2, 10

Ans: 3, 11, 7, 2, 5, 9, 9, 2 and 10

Arranging them in ascending order:

2, 2, 3, 5, 7, 9, 9, 10, 11

Number of terms, N= 9

It is an odd number.

$Meadian = \left(\frac{N+1}{2}\right)th\ observation$

$Median = \left(\frac{9+1}{2}\right)th\ observation$

Median = 5th observation

Median=7

Q.8 Find the median of first 15 odd numbers.

Ans: First 15 odd numbers are 1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27 and 29.

Number of terms, N = 15

It is an odd number.

$Median = \left(\frac{N+1}{2}\right)th\ observation$

$Median = \left(\frac{15+1}{2}\right)th\ observation$

Median = 15

Q.9 Find the median of first 10 even numbers.

Ans: First 10 even numbers are 2, 4, 6, 8, 10, 12, 14, 16, 18 and 20.

Number of terms, N=10

$Median = \frac{1}{2}\left\{\left(\frac{N}{2}\right)th\ observation + \left(\frac{N}{2} + 1\right)th\ observation\right\}$

$Median = \frac{1}{2}(5\ th\ observation + 6\ th\ observation)$

$Median = \frac{1}{2}(10 + 12)$

$= 11$

Q.10 Find the median of first 50 whole numbers.

Ans: First 50 whole numbers are 0, 1, 2, 3, 4 ... and 49.

Number of terms, N= 50

It is an even number.

$Median = \frac{1}{2}\left\{\left(\frac{N}{2}\right)th\ observation + \left(\frac{N}{2} + 1\right)th\ observation\right\}$

$Median = \frac{1}{2}(25\ th\ observation + 26\ th\ observation)$

$Median = \frac{1}{2}(24 + 25)$

$= 24.5$

Q.11 The marks of 15 students (out of 50) in an examination are 20, 22, 26, 31, 40, 19, 17, 19, 25, 29, 23, 17, 24, 21, 35. Find the median marks.

Ans: Marks of the students (out of 50) in an examination are given below:

20, 22, 26, 31, 40, 19, 17, 19, 25, 29, 23, 17, 24, 21, 35

Arranging the marks in ascending order:

17, 17, 19, 19, 20, 21, 22, 23, 24, 25, 26, 29, 31, 35, 40

Number of terms, N=15

This is an odd number.

$Median = \left(\frac{N+1}{2}\right)th\ observation$

$Median = \left(\frac{15+1}{2}\right)th\ observation$

Median = 8 th observation

Median = 23

Hence, the median marks are 23.

Q.12 The ages (in years) of 10 teachers in a school are 34, 37, 53, 46, 52, 43, 31, 36, 40, 50.

Find the median age.

Ans: Ages (in years) of 10 teachers in a school are given below:

34, 37, 53, 46, 52, 43, 31, 36, 40, 50

Arranging them in ascending order:

31, 34, 36, 37, 40, 43, 46, 50, 52, 53

Number of terms, N=10

It is an even number.

$Median = \frac{1}{2}\left\{\left(\frac{N}{2}\right)th\ observation + \left(\frac{N}{2} + 1\right)th\ observation\right\}$

$Median = \frac{1}{2}(5\ th\ observation + 6\ th\ observation)$

$Median = \frac{1}{2}(40 + 43)$

Median = 41.5

Hence, the median age is 41.5 years.

Q.13 Calculate the median for the following data:

Marks	15	17	20	22	25	30
Number of students	3	5	9	4	6	10

Ans: Cumulative frequency table:

Marks	Number of students	Cumulative frequency
15	3	3
17	5	8
20	9	17
22	4	21
25	6	27
30	10	37

Number of terms, N = 37

$Median = \left\{\left(\frac{N+1}{2}\right)th\ observation\right\}$

$= \left\{\left(\frac{37+1}{2}\right)th\ observation\right\}$

$= 19\ th\ observation$

$= 22$

Hence, the median is 22.

Q.14 The ages (in years) of 11 cricket players are given below:

28, 34, 32, 41, 36, 32, 32, 38, 32, 40, 31. Find the mode of the ages.

Ans: Following are the ages (in years) of 11 cricket players:

28, 34, 32, 41, 36, 32, 32, 38, 32, 40, 31

Mode is the value of the variable that occurs most frequently.

Here, 32 occurs maximum number of times.

Hence, 32 is the mode of the ages.

Q.15 The heights (in cm) of 50 students of a class are given below: Find the median height.

Height (in cm)	156	154	155	151	157	152	153
Number of students	8	4	10	6	7	3	12

Ans: Cumulative frequency table:

Height (in cm)	Number of students	Cumulative frequency
151	6	6
152	3	9
153	12	21
154	4	25
155	10	35
156	8	43
157	7	50

Number of terms, N = 50

$Median = \frac{1}{2}\left\{\left(\frac{N}{2}\right)th\ observation + \left(\frac{N}{2}+1\right)th\ observation\right\}$

$= \frac{1}{2}\{25\ th\ observation + 26\ th\ observation\} = \frac{1}{2}\{154 + 155\}$

Median $=154.5$