

MATHEMATICS NOTES FOR 7TH CLASS (FOR ISLAMABAD)

Chapter 12

DATA HANDLING

Exercise 12.1

1. Make a frequency distribution table using two as the size of class. (i.e. 0 – 1, 2 – 3,)

3 7 6 10 9 8 7 6 5 1 2 4 8 7
5 3 2 1 0 7 6 5 4 3 4

Ans. Arrange

0, 1, 1, 2, 2, 3, 3, 3, 4, 4, 4, 5, 5, 5, 6,
6, 6, 7, 7, 7, 7, 8, 8, 9, 10

Groups	Observations	Frequency
0–1	0, 1, 1	3
2–3	2, 2, 3, 3, 3	5
4–5	4, 4, 4, 5, 5, 5	6
6–7	6, 6, 6, 7, 7, 7, 7	7
8–9	8, 8, 9	3
10–11	10	1
Total		25

2. The following data shows the number of workers in a certain factory according to their ages.

Age Group	Frequency
15 – 24	10
25 – 34	15
35 – 44	20
45 – 54	25
55 – 64	30
65 – 74	9
75 – 84	1

With reference to the above table determine the following.

- (i) Total number of workers in the factory.

Ans. 110 workers

- (ii) Frequency of 7th class.

Ans. One

- (iii) No. of workers of ages (45 – 74).

Ans. 64

- (iv) No. of workers having ages less than 35 years.

Ans. 25

- (v) Size of each age group.

Ans. 10

3. The number of mistakes per page by 30 students are given below.

4 7 12 3 2 9 2 1 8 13 12 1
11 5 4 6 3 14 7 11 5 12 7 9
3 10 1 7 3 4

Group the data taking 3 as the size of the interval.

Ans.

Groups	No. of Mistakes	Frequency
0–2	1, 1, 1, 2, 2	5
3–5	3, 3, 3, 3, 4, 4, 4, 5, 5	9
6–8	6, 7, 7, 7, 7, 8	6
9–11	9, 9, 10, 11, 11	5
12–14	12, 12, 12, 13, 14	5
Total		30

4. The number of persons died from a disease across 20 hospitals during a month are given below.

18 24 8 11 7 5 25 14 9 12 17
6 3 27 15 19 21 4 20 13

Group the data taking 5 as the size of class.

Ans.

MATHEMATICS NOTES FOR 7TH CLASS (FOR ISLAMABAD)

Groups	No. of Persons	Frequency
0-5	3, 4, 5	3
6-10	6, 7, 8, 9	4
11-15	11, 12, 13, 14, 15	5
16-20	17, 18, 19, 20	4
21-25	21, 24, 25	3
26-30	27	1
Total		20

5. The marks of 80 students in the subject of computer of 10th class are recorded at a school as under:

68 84 75 82 68 90 62 88 76 93
73 79 88 73 60 93 71 59 85 75
61 65 75 89 74 62 95 78 63 72
65 80 73 57 89 78 62 76 53 74
86 67 73 81 72 63 76 75 85 77
66 78 82 75 94 77 69 74 68 60
96 78 89 61 75 95 60 79 83 71
79 62 69 97 78 85 76 65 71 75

(a) Make a frequency distribution using 5 as size of class.

(b) Make a frequency distribution table using 7 as size of class.

Ans. (a)

Groups	Marks	Frequency
51-55	53	1
56-60	57, 59, 60, 60, 60	5
61-65	61, 61, 62, 62, 62, 63, 63, 65, 65, 65	11
66-70	66, 67, 68, 68, 68, 69, 69	7
71-75	71, 71, 71, 72, 72, 73, 73, 73, 73, 74, 74, 74, 75, 75, 75, 75, 75, 75	19
76-80	76, 76, 76, 76, 77, 77, 78, 78, 78, 78, 79, 79, 79, 80	15
81-85	81, 82, 82, 83, 84, 85, 85, 85	8
86-90	86, 88, 88, 88, 89, 89, 90	7
91-95	93, 93, 94, 95, 95	5
96-100	96, 97	2
Total		80

(b)

Groups	Marks	Frequency
51-57	53, 57	02
58-64	59, 60, 60, 60, 61, 61, 62, 62, 62, 63, 63	12
65-71	65, 65, 65, 66, 67, 68, 68, 68, 69, 69, 71, 71, 71	13
72-78	72, 72, 73, 73, 73, 73, 74, 74, 74, 75, 75, 75, 75, 75, 75, 76, 76, 76, 76	20
79-85	79, 79, 79, 80, 81, 82, 82, 83, 84, 85, 85, 85	12
86-92	86, 88, 88, 88, 89, 89, 90	07
93-99	93, 93, 94, 95, 95, 96, 97	07
Total		80

6. The marks of 20 students in the subject of mathematics of grade VII class are recorded at a school as under:

109 118 99 126 132 89 123 90 85 92
135 119 122 144 94 105 139 128 142 148

Group the data taking 10 as the size of the interval.

Ans.

Groups	Marks	Frequency
80-89	85, 89	02
90-99	90, 92, 94, 99	04
100-109	105, 109	02
110-119	118, 119	02
120-129	122, 123, 126, 128	04
130-139	132, 135, 139	03
140-149	142, 144, 148	03
Total		20

Exercise 12.2

1. Find the mean of the following number.

(i) 5, 3, 12, 8 and 22.

$$\begin{aligned} \text{Ans. Mean} &= \frac{\text{Sum of values}}{\text{No. of values}} \\ &= \frac{5 + 3 + 12 + 8 + 22}{5} \end{aligned}$$

MATHEMATICS NOTES FOR 7TH CLASS (FOR ISLAMABAD)

$$= \frac{50}{5} = 10$$

(ii) 103, 105, 108, 112 and 122.

$$\begin{aligned} \text{Ans. Mean} &= \frac{\text{Sum of values}}{\text{No. of values}} \\ &= \frac{103 + 105 + 108 + 112 + 122}{5} \\ &= \frac{550}{5} = 110 \end{aligned}$$

(iii) The marks obtained by 10 students are given below find their mean.

35 67 30 52 57 49 76 66 36 22

$$\begin{aligned} \text{Ans. Mean} &= \frac{\text{Sum of values}}{\text{No. of values}} \\ &= \frac{35+67+30+52+57+49+76+66+36+22}{10} \\ &= \frac{490}{10} = 49 \end{aligned}$$

2. The height of 10 boys were measured in cm and the results were as follows.

143 148 150 135 128 139
149 146 151 132

(i) What is the height of the tallest boy?

Ans. 151cm

(ii) What is the height of the shortest boy?

Ans. 128cm

(iii) What is the mean height?

$$\begin{aligned} \text{Ans. Mean} &= \frac{\text{Sum of heights}}{\text{No. of heights}} \\ &= \frac{143+148+150+135+128+139+149+146+151+132}{10} \\ &= \frac{1421}{10} = 142.1 \text{ cm} \end{aligned}$$

(iv) How many boys are there whose heights are less than the mean height?

Ans. 128, 132, 135, 139
4

3. Find the mean of each of the following distribution.

(i)

x	0	1	2	3	4	5
f	12	18	15	9	3	3

(ii)

x	15	16	17	18	19	20
f	12	18	15	9	3	3

Ans. (i)

x	f	fx
0	12	0
1	18	18
2	15	30
3	9	27
4	3	12
5	3	15
	$\Sigma f = 60$	$\Sigma fx = 102$

$$\text{Mean} = \frac{\Sigma fx}{\Sigma f}$$

$$\bar{X} = \frac{102}{60} = 1.7$$

(ii)

x	f	fx
15	12	180
16	18	288
17	19	323
18	9	162
19	3	57
20	3	60
	$\Sigma f = 64$	$\Sigma fx = 1070$

$$\text{Mean} = \frac{\Sigma fx}{\Sigma f}$$

$$\bar{X} = \frac{1070}{64} = 16.7$$

MATHEMATICS NOTES FOR 7TH CLASS (FOR ISLAMABAD)

4. Student got the following marks in a mathematics test.

10 12 5 8 18 20 6 12 4 5

(i) Find the mean.

Ans. Mean = $\frac{\text{Sum of values}}{\text{No. of values}}$

$$\frac{10 + 12 + 5 + 8 + 18 + 20 + 6 + 12 + 4 + 5}{10}$$

$$= \frac{100}{10} = 10$$

(ii) Find the mean if marks for another student i.e. 21 is added.

Ans. Mean = $\frac{\text{Sum of values}}{\text{No. of values}}$

$$= \frac{100 + 21}{11} = \frac{121}{11} = 11$$

5. Find the median of the following data.

(i) 84 95 72 8 72 67 80 91

Ans. The values arranged in ascending order

67, 72, 72, 80, 84, 88, 91, 95

$$\text{Median} = \frac{80 + 84}{2} = \frac{164}{2} = 82$$

(ii) 70 73 69 68 75 81 82

Ans. Arranged in ascending order

68, 69, 70, 73, 75, 81, 82

Median = 73

(iii) 45 47 42 40 48 40 47 4 41

Ans. Arranged in ascending order

40, 40, 41, 42, 44, 45, 47, 47, 48

Median = 44

(iv) 10 30 12 15 50 49 18 20

Ans. Arranged in ascending order

10, 12, 15, 18, 20, 30, 49, 50

$$\text{Median} = \frac{18 + 20}{2} = \frac{38}{2} = 19$$

(v) 43 46 49 51 47 55 50 47

Ans. Arranged in ascending order

43, 46, 47, 47, 49, 50, 51, 55

$$\text{Median} = \frac{47 + 49}{2} = \frac{96}{2} = 48$$

6. Find the mode of the following data.

(i) 3 4 4 6 7 5 4 5

Ans. Mode is height frequency in data so 4.

(ii) 5 8 7 6 9 7 5 7 5 6 9 7

Ans. Mode is the height frequency in data so 7.

(iii) 3 7 5 4 9 5 0 2 5 1 6 3 4 5

Ans. Mode is the height frequency in data so 5.

7. Determine the mean, median and mode of the following data.

(i) 8 11 14 13 14 9 15

Ans. Mean = $\frac{\text{Sum of values}}{\text{No. of values}}$

$$\bar{X} = \frac{8 + 11 + 14 + 13 + 14 + 9 + 15}{7}$$

$$= \frac{84}{7} = 12$$

Median

Arrange the ascending order

8, 9, 11, 13, 14, 14, 15

Median = 13

Mode

Height frequency in data so 14.

(ii) 5 17 15 11 15 13 11 15 9

Ans. Mean = $\frac{\text{Sum of values}}{\text{No. of values}}$

$$\bar{X} = \frac{5 + 17 + 15 + 11 + 15 + 13 + 11 + 15 + 9}{9}$$

$$= \frac{111}{9} = 12.33$$

MATHEMATICS NOTES FOR 7TH CLASS (FOR ISLAMABAD)

Median

Arrange the ascending order

5, 9, 11, 11, 13, 15, 15, 15, 17

Median = 13

Mode

Height frequency in data so 15.

(iii) 10 11 13 11 15 16

Ans. Mean = $\frac{\text{Sum of values}}{\text{No. of values}}$

$$\bar{X} = \frac{10 + 11 + 13 + 11 + 15 + 16}{6}$$

$$= \frac{76}{6} = 12.67$$

Median

Arrange the ascending order

10, 11, 11, 13, 15, 16

$$\text{Median} = \frac{11 + 13}{2} = \frac{24}{2} = 12$$

Mode

Height frequency in data so 11.

8. The following table shows the number of students in various class in a sports week. Draw the pi graph and bar graph.

Games	Cricket	Hockey	Football	Badminton	Volley ball	Table Tennis
No. of Students	200	140	80	150	80	60

Ans. Total No. of student

$$= 200 + 140 + 80 + 150 + 80 + 60$$

$$= 710$$

$$\text{Cricket} = \frac{200}{710} \times 360 = 101.4^\circ$$

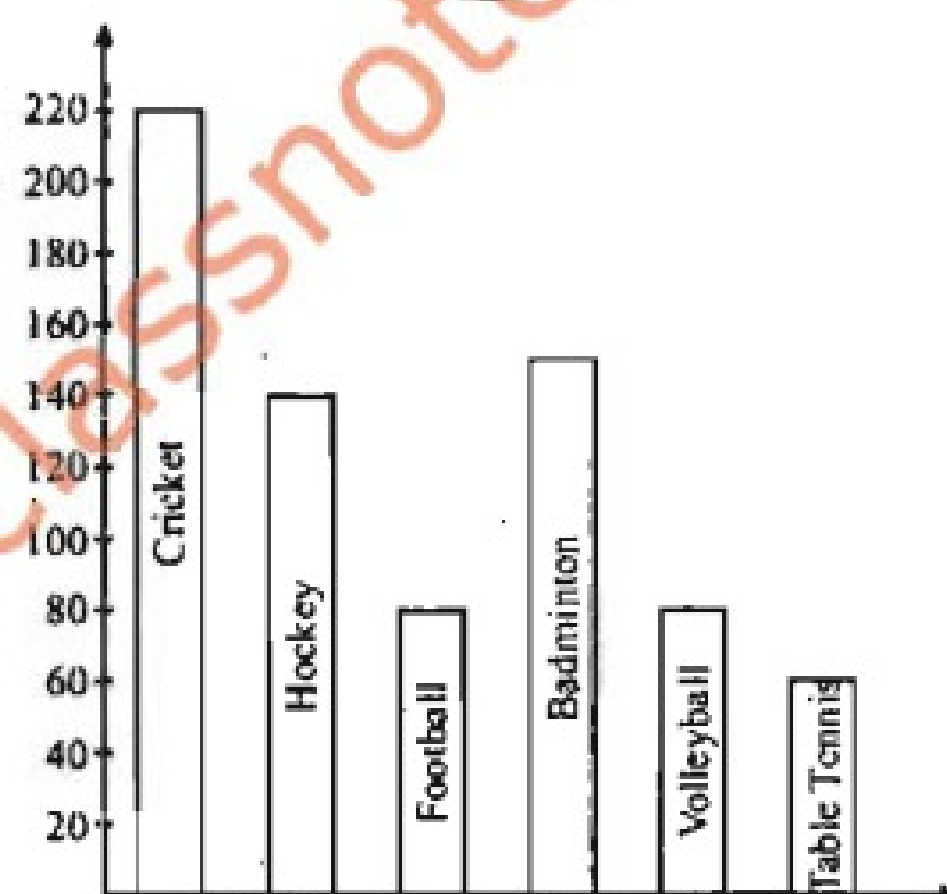
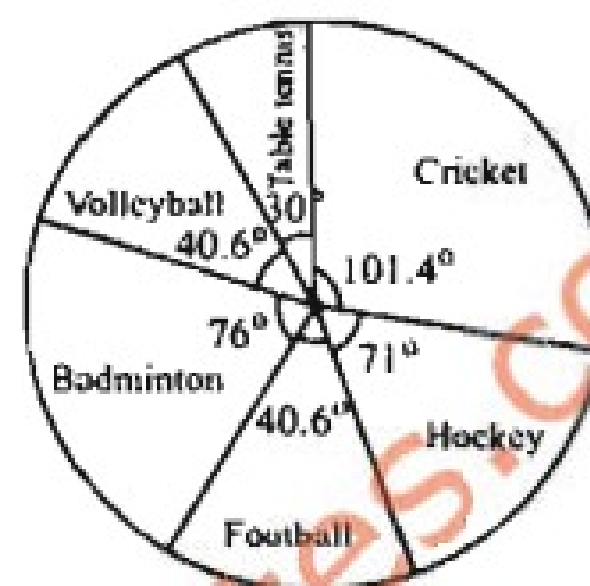
$$\text{Hockey} = \frac{140}{710} \times 360 = 71^\circ$$

$$\text{Football} = \frac{80}{710} \times 360 = 40.6^\circ$$

$$\text{Badminton} = \frac{150}{710} \times 360 = 76^\circ$$

$$\text{Volleyball} = \frac{80}{710} \times 360 = 40.6^\circ$$

$$\text{Table tennis} = \frac{60}{710} \times 360 = 30.4^\circ$$



9. Following table shows the expenditure on different items of a family. Draw a pie graph and bar graph.

Item	Food	Clothing	House Rent	Lighting	Education	Food	Misc
Expenditure	50	30	20	35	15	20	15

Ans. Total expenditure

$$= 50 + 30 + 20 + 35 + 15 + 20 + 15 = 185$$

$$\text{Food} = \frac{50}{185} \times 360 = 97.3^\circ$$

$$\text{Clothing} = \frac{30}{185} \times 360 = 58.4^\circ$$

MATHEMATICS NOTES FOR 7TH CLASS (FOR ISLAMABAD)

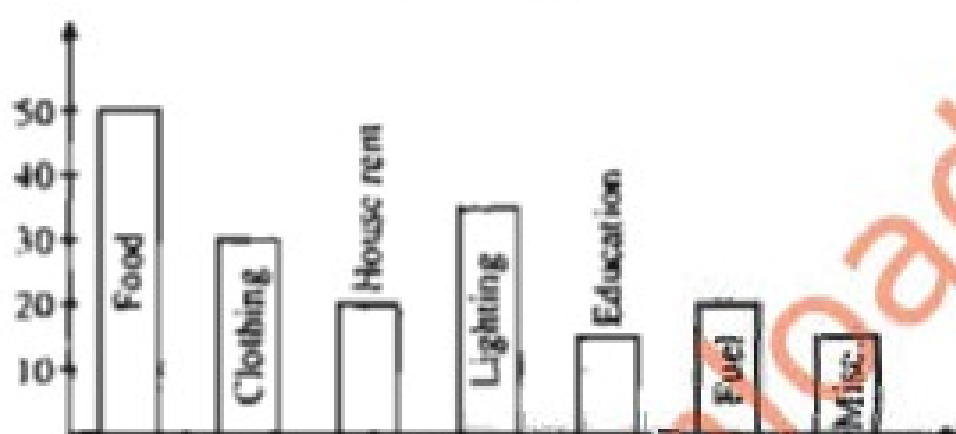
$$\text{House rent} = \frac{20}{185} \times 360 = 38.9^\circ$$

$$\text{Lighting} = \frac{35}{185} \times 360 = 68.1^\circ$$

$$\text{Education} = \frac{15}{185} \times 360 = 29.2^\circ$$

$$\text{Fuel} = \frac{20}{185} \times 360 = 38.9^\circ$$

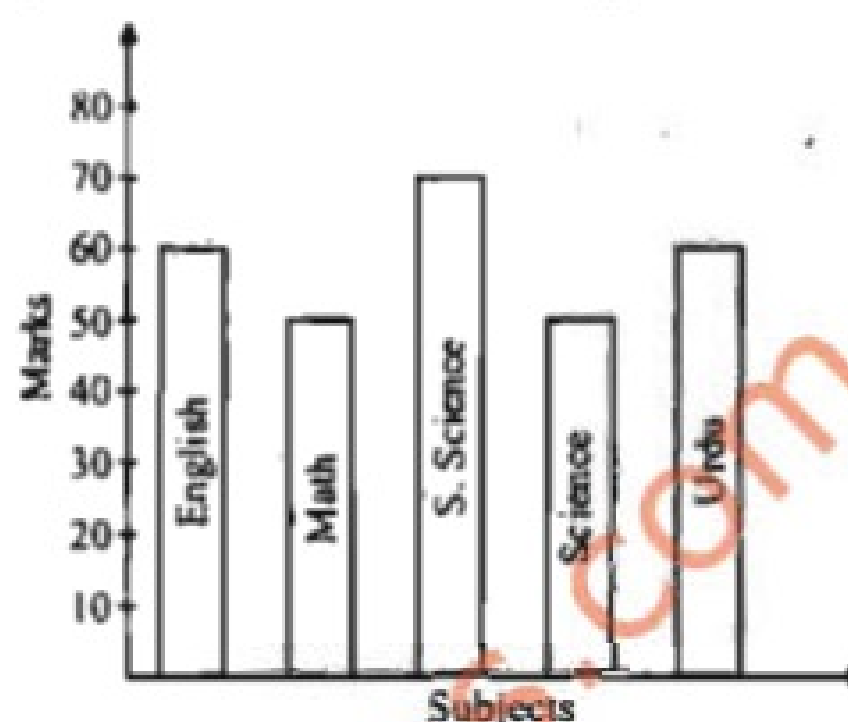
$$\text{Misc} = \frac{15}{185} \times 360 = 29.2^\circ$$



10. Look at the bar graph given below regarding marks of Shahzad and answer the following questions.

- What information does the bar graph give?
- In which subject is the student very good?
- In which subject is the student poor?
- What is the average of his marks?
- What is the average of mathematics and science?

(vi) What is the median of the data?



Ans.

- Comparison
- S. Science
- Mathematics
- 57
- 50
- 60

11. Suppose you own a school uniform shop, and you want to stock up the supply based on the age of the students residing in your locality. You can go through your bill book and write the ages of all the customers as follow:

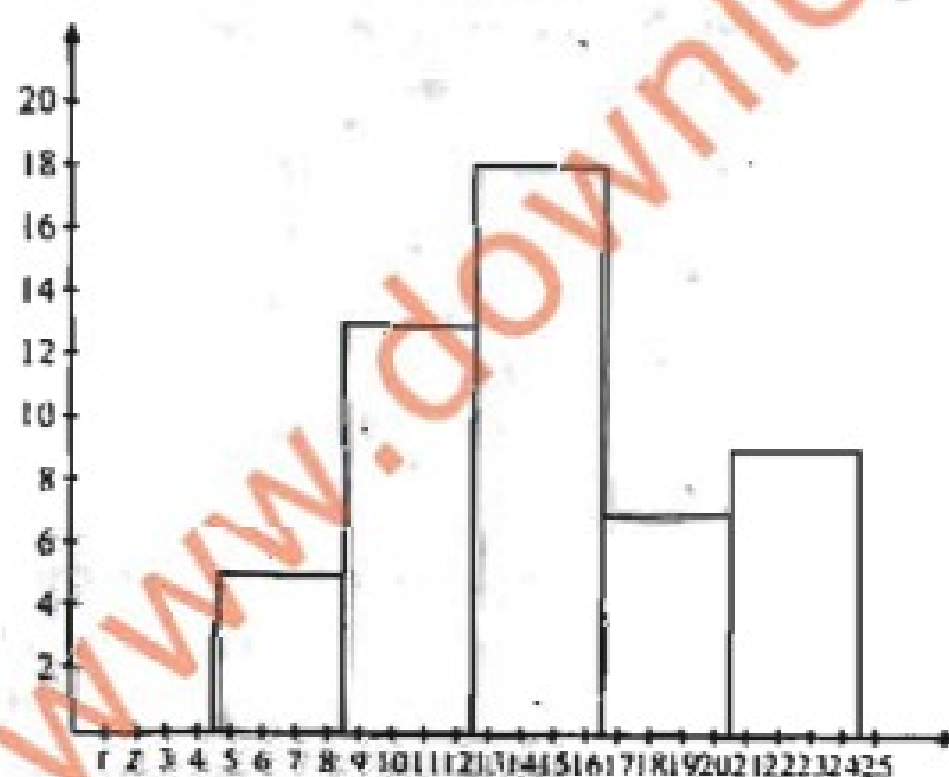
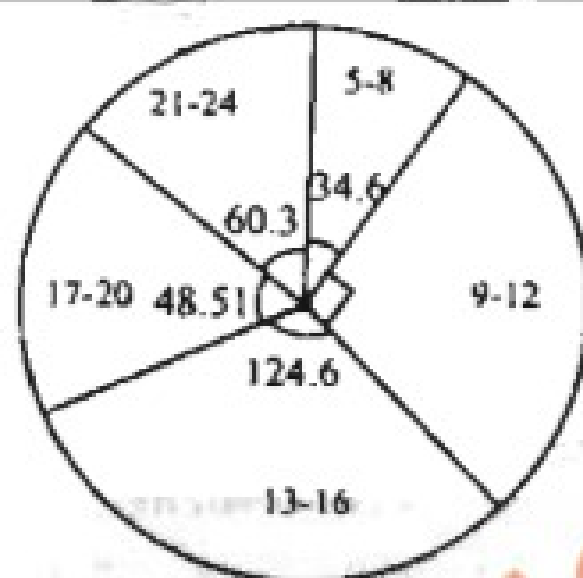
Age Data: 5, 5, 7, 6, 8, 11, 13, 11, 14, 12, 15, 23, 24, 15, 10, 24, 16, 16, 17, 11, 19, 23, 19, 14, 9, 11, 10, 16, 13, 14, 12, 15, 23, 14, 24, 16, 16, 17, 18, 19, 23, 18, 9, 23, 14, 11, 13, 11, 14, 12, 15, 22

Present this data as a frequency distribution using class interval from 5–8, 9–12, 13–16, 17–20, 21–24. And draw histogram and pie graph of the information.

Ans.

MATHEMATICS NOTES FOR 7TH CLASS (FOR ISLAMABAD)

Age groups	Observation	Frequency
5-8	5, 5, 7, 6, 8	5
9-12	11, 11, 12, 10, 11, 9, 11, 10, 12, 9, 11, 11, 12	13
13-16	13, 14, 15, 15, 16, 16, 14, 16, 13, 14, 15, 14, 16, 16, 14, 13, 14, 15	18
17-20	17, 19, 19, 17, 18, 19, 18	7
21-24	23, 24, 24, 23, 23, 24, 23, 23, 22	9
		$\Sigma f = 52$



Review Exercise 12

1. Circle the correct answer in the following questions.

(i) The data collected from the first information and written in ordinary form is called:

- ✓(a) ungrouped data
- (b) grouped data
- (c) arranged data
- (d) secondary data

(ii) The data written in systematic form or any particular order is called:

- (a) ungrouped data
- ✓(b) grouped data
- (c) scattered data
- (d) primary data

(iii) The most repeated value in the data is called:

- (a) mean
- ✓(b) mode
- (c) median
- (d) range

(iv) In a set of data 2, 5, 4, 5, 6, 5, 3, 4, 2 mode is:

- (a) 2
- (b) 3
- (c) 4
- ✓(d) 5

(v) The weekly income of 5 person are 3000, 5000, 4000, 2000 and 6000. Their arithmetic mean is:

- (a) 3000
- ✓(b) 4000
- (c) 5000
- (d) 6000

(vi) The lower limits of two intervals (41-45) and (46-50) are:

- (a) 41, 50
- (b) 45, 50
- ✓(c) 41, 46
- (d) 45, 46

(vii) The upper limits of two intervals (31-40) and (41-50) are:

- ✓(a) 40, 50
- (b) 31, 51

MATHEMATICS NOTES FOR 7TH CLASS (FOR ISLAMABAD)

- =====
- (c) 31, 41 (d) 40, 41
- (viii) *The median of the data 25, 15, 10, 5, 20 is:*
- (a) 5 (b) 10
- ✓(c) 15 (d) 20
- (ix) *Mean, Median and Mode are part of:*
- ✓(a) measure of central tendency
- (b) proportion
- (c) frequency
- (d) range
- (x) *Difference between the largest and the smallest value is called:*
- (a) mean (b) mode
- (c) median ✓(d) range
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