

**Unit No. 12**  
**INFORMATION HANDLING**  
**Review Exercise No. 12**

**Question No. 1**

Four options are given against each statement. Encircle the correct option.

**(i) Which data takes only some specific values?**

- (a) continuous data
- (b) discrete data**
- (c) grouped data
- (d) ungrouped data

**(ii) The number of times a value occurs in a data is called:**

- (a) frequency**
- (b) relative frequency
- (c) class limit
- (d) class boundaries

**(iii) Midpoint is also known as:**

- (a) mean
- (b) median
- (c) class limit
- (d) class mark**

**(iv) Frequency polygon is also drawn /constructed by using:**

- (a) histogram**
- (b) bar graph
- (c) class boundaries
- (d) class limit

**(v) The difference between the greatest value and the smallest value is called:**

- (a) class limits
- (b) midpoint
- (c) relative frequency
- (d) range**

**(vi) Measure of central tendency is used to find out the \_\_\_\_\_ of a data set.**

- (a) class boundaries
- (b) cumulative frequency

*(c) middle or centre value*

(d) frequency

**(vii) If the mean of 5, 7, 8, 9 and x is 7.5, what will be the value of x?**

(a) 10

*(b) 8*

(c) 8.5

(d) 5.8

**(viii) Find the mode of the given data: 2, 5, 8, 9, 0, 1, 3, 7 and 10**

(a) 5

(b) 7

(c) 0

*(d) no mode*

**(ix) In a data the values (observations) which appears or occurs most often is called:**

a) mean

*(b) mode*

(c) median

(d) weighted mean

**(x) Find the median of the given data: 110, 125, 122, 130, 124, 127 and 120**

*(a) 124*

(b) 120

(c) 125

(d) 127

## Question No. 2

**Define the following:**

**(i)** frequency distribution

**(ii)** histogram (unequal class limits)

**(iii)** mean

**(iv)** median

**Solution:**

**(i) Frequency Distribution:**

A frequency distribution is a table that displays the frequencies of various outcomes in a sample. It organizes raw data by showing the number of times each value or range of values appears.

**(ii) Histogram (unequal class limits):**

A histogram is a graphical representation of the distribution of numerical data. When class limits are unequal, the heights of the bars in the histogram need to be adjusted to represent frequency

density rather than just frequency, so that the area of each bar is proportional to the frequency of the class it represents.

(iii) **Mean:**

The mean is a measure of central tendency, calculated by summing all the values in a dataset and dividing by the number of values. It is also known as the arithmetic average.

(iv) **Median:**

The median is the middle value in a dataset when the values are arranged in ascending or descending order. If there is an odd number of values, the median is the single middle value. If there is an even number of values, the median is the average of the two middle values.

**Question No. 3**

Following are the weights of 40 students recorded to the nearest (lbs). 138, 164, 150, 132, 144, 125, 149, 157, 146, 158, 140, 147, 136, 148, 152, 144, 168, 126, 138, 176, 163, 119, 154, 165, 146, 173, 142, 147, 135, 153, 140, 135 161, 145, 135, 142, 150, 156, 145, 128.

(a) Make a frequency table taking size of class limits as 10

Data.

Class limit = 10

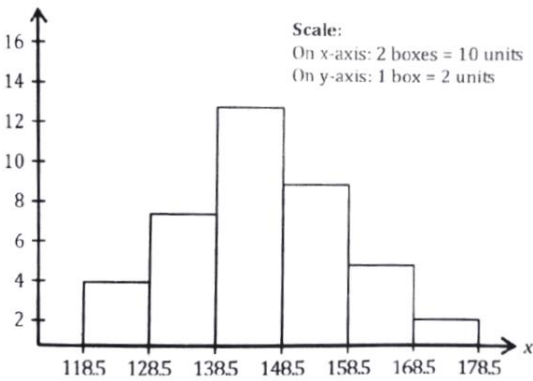
Number of observations = n = 40

**Solution:**

Class Limit	Tally Marks	f
119-128		4
129-138		7
139-148		13
149-158		9
159-168		5
169-178		2
		$\Sigma f = 40$

(b) Draw Histogram.

**Solution:**



(c) Draw a frequency polygon of the given

Solution:

Minimum value = 119

Maximum value = 176

Range = Maximum value - Minimum value  
= 176 - 119 = 57

Class Limits	Mid-Point	Frequency (f)
119 - 128	123.5	4
129 - 138	133.5	7
139 - 148	143.5	13
149 - 158	153.5	9
159 - 168	163.5	5
169 – 178	173.5	2
		Σf = 40

Frequency Polygon;



Question No. 4

From the table given below. Draw a frequency polygon on histogram for the given frequency distribution.

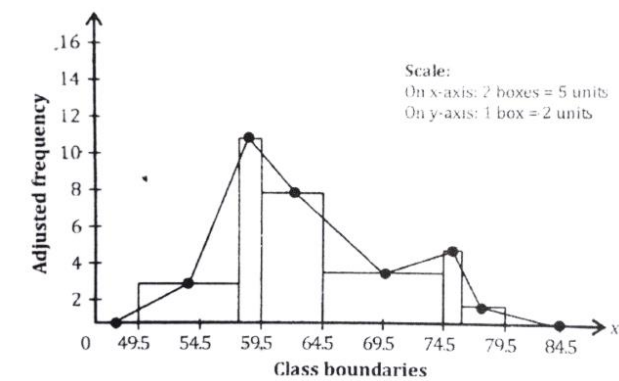
Weight (kg)	Frequency (f)
50 – 56	25
57 – 59	32
60 – 64	40
65 – 72	30
73 – 75	15
76 – 80	8

Solution:

Weight (kg)	C.B	f	Mid-Point	Class Width	Adj. Frequency
50 - 56	49.5-56.5	25	53	7	$\frac{25}{7} = 3.6$
57 - 59	56.5-59.5	32	58	3	$\frac{32}{3} = 10.7$
60 - 64	59.5-64.5	40	63	5	$\frac{40}{5} = 8$

65 - 72	64.5-72.5	30	68	8	$\frac{30}{8} = 3.7$
73 - 75	72.5-75.5	15	73	3	$\frac{15}{3} = 5$
76 - 80	75.5-80.5	8	78	5	$\frac{8}{5} = 1.6$
		$\Sigma f = 150$			

Frequency Polygon;



Question No. 5

Given below are marks obtained by 45 students in the monthly test of Biology:

Marks	No. of Students
20 - 24	05
25 - 29	08
30 - 34	12
35 - 39	15
40 - 44	03
45 - 49	02

With reference to the above table find the following:

Marks	M.P	No. of Students (f)
20 - 24	22	05
25 - 29	27	08
30 - 34	32	12
35 - 39	37	15
40 - 44	42	03
45 - 49	47	02

(i) upper class boundary of the 5th class.

Solution:

Upper class boundary of the 5th class is 44

(ii) lower class boundaries of all the classes.

**Solution:**

Lower class boundaries of all the classes;

19.5, 24.5, 29.5, 34.5, 39.5, 44.5

**(iii) midpoint of all the classes.**

**Solution:**

Midpoint of all the classes;

22, 27, 32, 37, 42, 47

**(iv) the class interval with the least frequency.**

**Solution:**

The class interval with the least frequency is (45 – 49) where frequency is 2.

**Question No. 6**

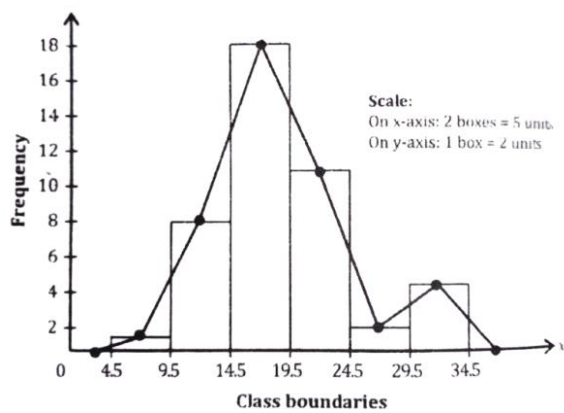
Given below is frequency distribution. Draw frequency polygon and histogram for the distribution.

Class limits	Frequency
5 - 9	1
10 - 14	8
15 - 19	18
20 - 24	11
25 - 29	2
30 - 34	5

**Solution:**

Class limits	f	C.B	M.P
5 - 9	1	4.5-9.5	7
10 - 14	8	9.5-14.5	12
15 - 19	18	14.5-19.5	17
20 - 24	11	19.5-24.5	22
25 - 29	2	24.5-29.5	27
30 - 34	5	29.5-34.5	32

**Diagram:**



Question No. 7

For the following data, find the weighted mean.

Item	Quantity	Cost of item (Rs.)
Chair	20	500
Table	20	400
Black board	10	750
Tube light	25	230
Cupboard	09	950

Solution:

Quantity W	Cost (Rs.) X	WX
20	500	10000
20	400	8000
10	750	7500
25	230	5750
09	950	8550
ΣW = 84		ΣWX = 39800

Weighted Mean =  $\frac{\Sigma WX}{\Sigma W}$

Weighted Mean =  $\frac{39800}{84}$

Weighted Mean = Rs. 473.81

Question No. 8

A principal of a school allocates funds of Rs.50, 000 to five different sectors:

- (i) chairs: Rs. 15000
- (ii) tables: Rs. 12,000
- (iii) black boards: Rs.6,000
- (iv) room renovation: Rs. 10,000
- (v) gardening: Rs. 7,000

Find the average of funds allocation in each sector of the school.

Solution:

Item	Quantity W	Cost (Rs.) X	WX
Chair	1	15000	15000
Table	1	12000	12000
Black board	1	6000	6000
Room Renovation	1	10000	10000
Gardening	1	7000	7000
	$\Sigma W = 5$		$\Sigma WX = 50000$

Average Funds Allocation per sector =  $\frac{\Sigma WX}{\Sigma W}$

Average Funds Allocation per sector =  $\frac{50000}{5}$

Average Funds Allocation per sector = Rs. 10000

Question No. 9

The marks of a student Saad in six tests were 84, 91, 72, 68, 87, 78. Find the arithmetic mean of his marks.

Data:

Marks = x = 84, 91, 72, 68, 87, 78

Sum of Marks =  $\Sigma X = 84 + 91 + 72 + 68 + 87 + 78 = 480$

No. of tests = n = 6

Solution:

Arithmetic Mean =  $\frac{\Sigma X}{n}$

Arithmetic Mean =  $\frac{480}{6}$

Arithmetic Mean = 80 Marks

Question No. 10

Adjoining distribution showed maximum load (in kg) supported by certain ropes. Find the mean load using short method.

Max Load Kg	No. of ropes
93 - 97	2
98 - 102	5
103 - 107	8
108 - 112	12
113 - 117	6
118 - 122	2

Solution:

Let; A = 105



Load	f	M.P (X)	D = X-A	fD
93 - 97	2	95	-10	-20
98 - 102	5	100	-5	-25
103 - 107	8	105	0	0
108 - 112	12	110	5	60
113 - 117	6	115	10	60
118 - 122	2	120	15	30
	Σf = 35			ΣfD = 105

Arithmetic Mean =  $A + \frac{\Sigma fD}{\Sigma f}$

Arithmetic Mean =  $105 + \frac{105}{35}$

Arithmetic Mean =  $105 + 3$

Arithmetic Mean = 108 Kg

Question No. 11

Usman rolled a fair dice eight times. Each time their sum was recorded as 8, 5, 6, 6, 9, 4, 3, 11. Find the median and mode of the sum.

Data:

Sum recorded by Usman when rolled dice = x = 8, 5, 6, 6, 9, 4, 3, 11

No. of observations = n = 8

To Find:

Median = ?

Mode = ?

Solution:

Arranged data = 3, 4, 5, 6, 6, 8, 9, 11

i). Finding Median:

As n = 8 is even number, So;

Median =  $\frac{1}{2} [(\frac{n}{2})^{th} \text{ obs.} + (\frac{n+2}{2})^{th} \text{ obs.}]$

Median =  $\frac{1}{2} [(\frac{8}{2})^{th} \text{ obs.} + (\frac{8+2}{2})^{th} \text{ obs.}]$

Median =  $\frac{1}{2} [(4)^{th} \text{ obs.} + (5)^{th} \text{ obs.}]$

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

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

Median = 6

ii). Finding Mode:

In data, 6 appears twice, so Mode of data is 6.

Question No. 12

Two partners Mr. Aslam and Mrs. Kalsoom run a company. In the following data the weekly wages (in Rs.) of employees who work in the company are given:

Wages (Rs.)	Employees
600 - 700	3
700 - 800	5
800 - 900	7
900 - 1000	21
1000 - 1100	11

Solution:

Wages (Rs.)	Employees (f)	M.P (x)	fx
600 - 700	3	650	1950
700 - 800	5	750	3750
800 - 900	7	850	5950
900 - 1000	21	950	19950
1000 - 1100	11	1050	11550
	$\Sigma f = 47$		$\Sigma fx = 43150$

i). Finding A. Mean:

A. Mean =  $\frac{\Sigma fx}{\Sigma f}$

A. Mean =  $\frac{43150}{47}$

A. Mean = Rs. 918.09

ii). Finding Median:

Wages (Rs.)	Employees (f)	c.f
600 - 700	3	3
700 - 800	5	8
800 - 900	7	15
<b>900 - 1000</b>	<b>21</b>	<b>36</b>
1000 - 1100	11	47
	$\Sigma f = 47$	

As n = 47, odd number, so;

Median class =  $\frac{n}{2} = \frac{47}{2} = 23.5 = 24$  which lies in 900 – 1000 class.

$l = 900$

$h = 100$

$n = 47$

$f = 21$

$c = 15$

Median =  $l + \frac{h}{f}(\frac{n}{2} - c)$

Median =  $900 + \frac{100}{21}(\frac{47}{2} - 15)$

Median =  $900 + 4.76(23.5 - 15)$

Median =  $900 + 4.76(8.5)$

Median =  $900 + 40.47$

Median = 940.47

iii). Finding Mode:

Wages (Rs.)	Employees (f)
600 - 700	3
700 - 800	5
800 - 900	7
<b>900 - 1000</b>	<b>21</b>
1000 - 1100	11
	$\Sigma f = 47$

$l = 900$

$h = 100$

$f_m = 21$

$f_1 = 7$

$f_2 = 11$

$n = 47$

Mode =  $l + \frac{(f_m - f_1) \times h}{(f_m - f_1) + (f_m - f_2)}$

Mode =  $900 + \frac{(21 - 7) \times 100}{(21 - 7) + (21 - 11)}$

Mode =  $900 + \frac{14 \times 100}{14 + 10}$

Mode =  $900 + \frac{1400}{24}$

Mode =  $900 + 58.33$

Mode = 958.33