Day -108

Ch -16

3-1-22

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Course overview chart

Day -1 - Introduction, collection of data, Arithmetic mean, solving Ex: 16.1 (1st to 4th sum)

Day -2 - Exercise: 16.1 (5th to 13th sum)

Day -3 - Median, Ex: 16.2 (1st to 5th sum)

Day -4 - Mode, Exercise: 16.3 (1st to 3rd), Bar graph and double bar graph with example sums

Day -5 - Example sums for double bar graph and Ex: 16.4 (1st to 3rd sum) [Drawing double bar graph]

Flow chart

Mathematics

↓

statistics

↓

Data Handling

Ex - 16.1

1 The age in years of 10 employees in ascending order, we get

23, 27, 28, 29, 30, 31, 32, 35, 40, 41

a What is the age of the oldest and youngest employee.

Ans The age of the oldest employee is 41 years

The age of the youngest employee is 23 years

b What is the range of the ~~angle~~ ages of the employees?

Ans Range = Highest observation - Lowest observation

The range of the ages of the employee = 41 - 23 = 18 years

c Find the mean age of the employees

Ans The mean age of the employee = $\frac{\text{sum of the employee ages}}{\text{No. of employee}}$

$$= \frac{32 + 41 + 29 + 30 + 35 + 40 + 27 + 28 + 31 + 23}{10}$$

$$= \frac{316}{10} = 31.6 \text{ years}$$

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2 The average time for which ~~Anita~~ Aniba studies for 5 days

Mean = sum of the hours is each day / No. of days

$= \frac{3+5+4+3+5}{5} = \frac{20}{5} = 4$ hours

∴ Aniba studies 4 hrs on an average of each day

3 Arrange the height of ~~the~~ ten boys in ascending order, we get

122, 128, 134, 135, 140, 145, 147, 150, 152, 154

a What is the height of the tallest boy?

Ans The height of the tallest boy = 154 cm

b What is the height of the shortest boy?

Ans The height of the shortest boy = 122 cm

c What is the range of the height?

Ans Range = Height observation - Lowest observation

The range of the height = 154 - 122

= 32 cm

d What is the mean height?

Ans No. of students = 10

Mean height = $\frac{\text{sum of all observations}}{\text{Total no. of observations}}$

$= \frac{122+128+134+135+140+145+147+150+155+154}{10}$

$= \frac{1410}{10}$

∴ Mean height of the boys = 140.7 cm

4 The

Subjects	Eng	Hindi	Math	Science	Soc.
Marks	67	76	88	85	78

a What is the total marks?

The total marks = 67 + 76 + 88 + 85 + 78

= 394 marks

b ~~What is the total marks?~~

~~The total marks = 67 + 76 + 88 + 85 + 78 = 394~~

= 394 marks

c What is the average marks?

The average marks = $\frac{\text{sum of the marks}}{\text{total no. of subjects}}$

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$= \frac{67+76+88+85+78}{5} = \frac{394}{5} = 78.8$

Average marks = 78.8 marks

c In which subjects student has scored highest marks?
Ans The student scored highest mark in math

d In which subject student has scored lowest marks?
Ans The students scored lowest mark in English.

e What is the range of the marks obtained?
Ans Range = Highest marks − lowest marks
The range of the marks obtained = 88 − 67
= 21 marks

5. The first 10 natural no's = 1, 2, 3, 4, 5, 6, 7, 8, 9, 10

Mean $= \frac{1+2+3+4+5+6+7+8+9+10}{10}$

$= \frac{55}{10} = 5.5$

∴ Mean of first 10 natural no. = 5.5

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Ex-16.1

5. The 1st 10 natural no's = 1, 2, 3, 4, 5, 6, 7, 8, 9, 10

$$\text{Mean} = \frac{1+2+3+4+5+6+7+8+9+10}{10} = \frac{55}{10}$$

$$= 5.5$$

∴ Mean of first 10 natural no = 5.5

6. The 1st 20 odd natural no's =

1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31, 33, 35, 37, 39

$$\text{Mean} = \frac{1+3+5+7+9+11+13+15+17+19+21+23+25+27+29+31+33+35+37+39}{20}$$

$$= \frac{400}{20} = 20$$

∴ Mean of 1st 20 odd natural no = 20

7. The 1st 5 prime no's = 2, 3, 5, 7, 11

The mean of 1st 5 prime no's = $\frac{\text{sum of 1st 5 prime no's}}{\text{total no's}}$

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

$$= \frac{28}{5}$$

$$= 5.6$$

∴ Mean of 1st 5 prime no's = 5.6

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8 The 1st 10 multiples of 10 = 10, 20, 30, 40, 50, 60, 70, 80, 90, 100

The mean of 1st 10 multiples of 10 = $\frac{\text{Sum of 1st 10 multiples of 10}}{\text{Total no. s}}$

$= \frac{10+20+30+40+50+60+70+80+90+100}{10}$

$= \frac{550}{10} = 55$

∴ The mean of 1st 10 multiples of 10 = 55

9 Factor of 120 = 1, 2, 3, 4, 5, 6, 8, 10, 12, 15, 20, 24, 30, 40, 60, 120

Mean = $\frac{\text{Sum of all the factors}}{\text{No. of factors}}$

$= \frac{1+2+3+4+5+6+8+10+12+15+20+24+30+40+60+120}{16}$

$= \frac{360}{16} = 22.5$

∴ Mean of the factors of 120 = 22.5

10

x	3	10	21	12	25
f	2	4	5	3	6

The mean of the observation

x	f	$f_i x_i$
3	2	6
10	4	40
21	5	105
12	3	36
25	6	150
Total	20	337

$$\text{Mean} = \frac{\Sigma f_i \times x_i}{\Sigma f_i} = \frac{337}{20} = 16.85$$

11

Weight (in kg)	32	28	30	25	31
No. of students	5	4	3	6	7

The weight of 25 students in the class given

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Weight (kg) x_i	No. of students (f_i)	$f_i x_i$
32	5	160
28	4	112
30	3	90
25	6	150
31	7	217
Total	25	729

$$\text{Mean} = \frac{\sum f_i \times x_i}{\sum f_i} = \frac{729}{25} = 29.16 \text{ kg}$$

12 A dice was thrown 20 times

Arranging the out comes = 1, 1, 1, 2, 2, 2, 2, 2, 2, 3, 3, 3, 3, 4, 4, 5, 5, 6, 6, 6

Outcome (x_i)	No. of times (f_i)	$f_i x_i$
1	3	3
2	6	12
3	4	12
4	2	8
5	2	10
6	3	18
Total	20	63

$$\text{Mean} = \frac{\sum f_i x_i}{\sum f_i} = \frac{63}{20} = 3.15$$

~~The runs scored by 4 p~~

13 Answer the following questions

a Find the mean of the runs of the 4 players

Mean of the 4 players in 4 Iday maches.

$$\text{Mean of Bala} = \frac{12+8+40+24}{4} = \frac{84}{4} = 21$$

$$\text{Mean of Ravi} = \frac{34+46+42+56}{4} = \frac{178}{4} = 44.5$$

$$\text{Mean of Vikas} = \frac{9+24+12}{3} = \frac{45}{3} = 15$$

$$\text{Mean of Sameer} = \frac{10+22+12+24}{4} = \frac{68}{4} = 17$$

b Who is the least perfermer?

Ans Ravi is the lee performer

c To find mean runs of vikas, would you divide the total by 3 or 4? Why?

Ans Vikas mean to be calculated by 3, because he played only in 3 matches

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Ex - 16.2

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1 Find the median of:

a 3, 2, 5, 1, 7, 1, 4, 9, 2

The median of 3, 2, 5, 1, 7, 1, 4, 9 2

Ascending order = 1, 1, 2, 2, 3, 4, 5, 7, 9

No. of observations = 9 (odd)

$\left(\frac{n+1}{2}\right)^{th}$ observation $= \frac{9+1}{2} = \frac{10}{2} = 5^{th}$ observation

The median of the data given = 3

b 21, 10, 17, 19, 23, 20, 14, 10, 23, 15, 13

The median of 21, 10, 17, 19, 23, 20, 14, 10, 23, 15, 13

Ascending order = 10, 10, 13, 14, 15, 17, 19, 19, 20, 21, 23, 23

No. of observation = 11 (odd)

$\left(\frac{n+1}{2}\right)^{th}$ observation

$= \frac{11+1}{2} = \frac{12}{2} = 6^{th}$ observation

The median of the data given = 17

c 21, 3, 5, 16, 17, 9, 18, 12, 2, 19, 12, 25, 15

The median of 21, 3, 5, 16, 17, 9, 18, 12, 2, 19, 12, 25, 15

Ascending order = 2, 3, 5, 9, 12, 12, 15, 16, 17, 18, 19, 21, 25

No. of observation = 13 (odd)

$\left(\frac{n+1}{2}\right)^{th}$ observation

7^{th} observation

The median of the data given = 15

2 Find the median of

a The median of 95, 91, 81, 100, 78, 68

Ascending order = 68, 78, 81, 91, 95, 100

No. of observations = 6 (even)

Average of 81 and 91 = $\frac{81+91}{2} = \frac{172}{2} = 86$

Median = 86

b The median of 10, 32, 12, 45, 23, 22, 67, 78, 54, 36

Ascending order = 10, 12, 22, 23, 32, 36, 45, 54, 67, 78

No. of observation = 10 (even)

Average of 32 and 36 = $\frac{32+36}{2} = \frac{68}{2} = 34$

Median = 34

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2 The median of 6, 12, 6, 12, 18, 16

Ascending order = 6, 6, 12, 12, 16, 18

No. of observations = 6 (even)

The median is the average of 3rd and 4th observation

Average of 12 and 12 = $\frac{12+12}{2} = \frac{24}{2}$

Median = 12

3 The first 10 odd natural no's = 1, 3, 5, 7, 9, 11, 13, 15, 17, 19

No. of observation = 10 (even)

$\left(\frac{n}{2}\right) = \frac{10}{2}$ = 5-th observation

The median of the data given = 9

The median of is the average of 5-th and 6th observation

Average of 9 and 11 = $\frac{9+11}{2}$

$= \frac{20}{2} = 10$

∴ Median of the first 10 odd natural numbers = 10

4 The first 15 prime no's = 2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 37, 41, 43, 47

No. of observation = 15 (odd)

$\left(\frac{n+1}{2}\right)$ th observation $= \frac{15+1}{2} = \frac{16}{2}$

$= 8^{th}$ observation

$= 19$

The median of the data given = 19

5 The ages (in years) of 10 employee of a firm = 30, 33, 54, 28, 26, 32, 45, 33, 54, 45

Ascending order of the ages given = 26, 28, 30, 32, 33, 37, 45, 45, 54, 54

No. of observation = 10 (even)

$\left(\frac{n}{2}\right)^{th} = \frac{10}{2} = 5^{th}$ observation

The median of the data given = 33

$\left(\frac{n}{2}+1\right)^{th} = \left(\frac{10}{2}+1\right) = 6^{th}$ observation

The median of the data given = 37

The median is the average of 5th and 6th observation

Average of 33 and 37 $= \frac{33+37}{2} = \frac{70}{2} = 35$

Median = 35 years

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Ex 16.3

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1 Find the mode of the data

a 1, 3, 5, 2, 4, 6, 5, 2, 2, 3, 2, 4, 5, 6, 2, 2, 3, 1, 2, 4

Arrange the data in ascending order

1, 1, 1, 1, 2, 2, 2, 2, 2, 2, 2, 3, 3, 3, 4, 4, 4, 5, 5, 5, 6, 6

No. of events	Occurrence
1	4
2	8
3	3
4	3
5	3
6	2

Mode of the data = 2

b 10, 8, 3, 8, 7, 2, 5, 8, 2, 3, 8, 10, 8, 5

Arrange the data in ascending order:

2, 2, 3, 3, 5, 5, 7, 8, 8, 8, 8, 8, 10, 10

No. of events	Occurrence
2	2
3	2
5	2
7	1
8	5
10	2

Mode of data = 8

2 Arrange the data in ascending order

29, 29, 31, 31, 35, 35, 35, 35, 37, 37, 38, 38, 41

Marks	No. of students
29	2
31	2
35	4
37	2
38	2
41	1

Mode of the data = 35 (most frequently occured)

3 Arrange the data in ascending order

14, 14, 15, 15, 16, 16, 16, 16, 17, 17, 17, 18

Ages	No. of players
14	2
15	2
16	4
17	3
18	1

Mode of data = 16

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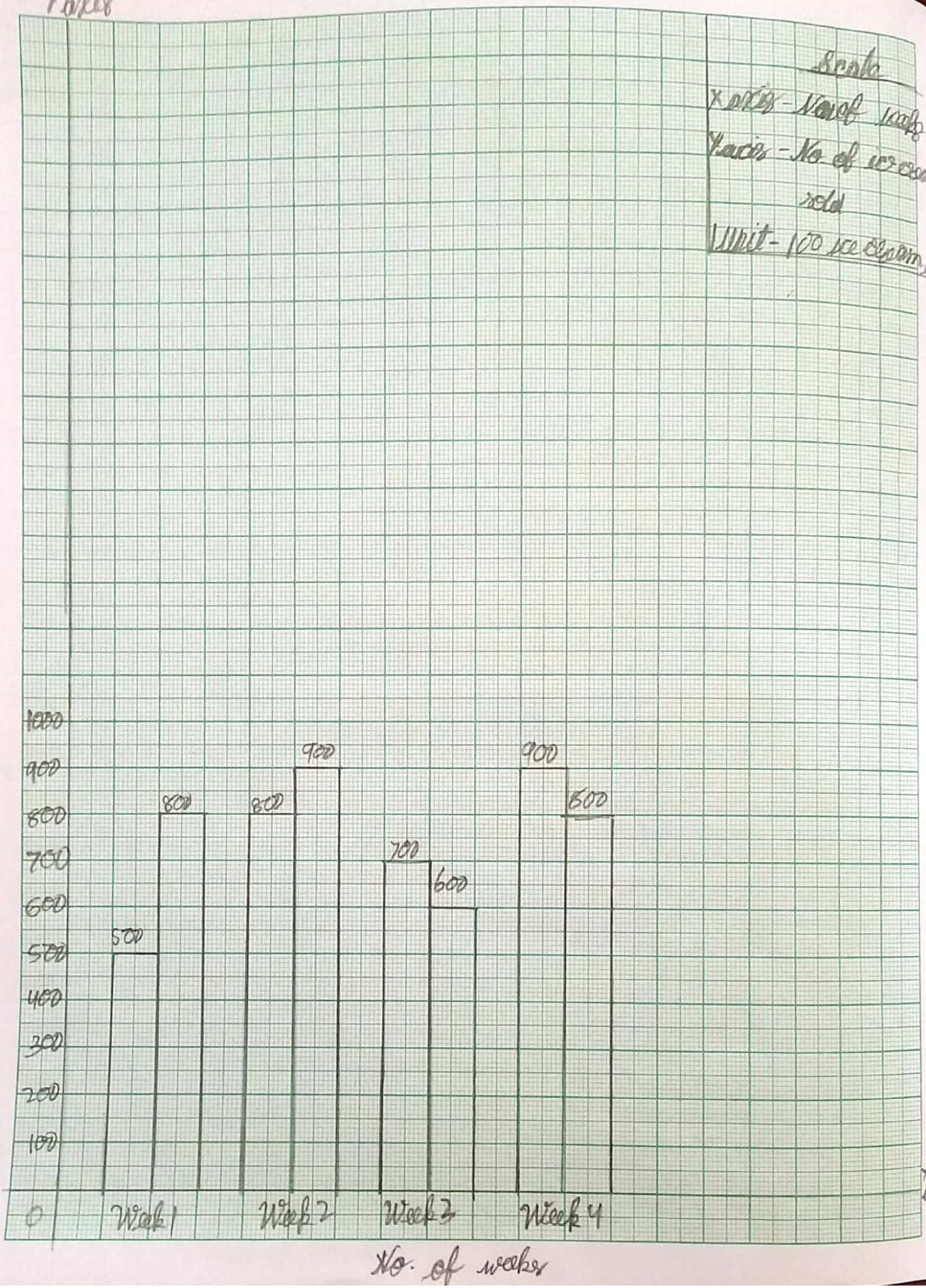

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	July	August
Week 1	500	800
Week 2	800	900
Week 3	700	600
Week 4	900	80

Teacher's Signature : _____