Q.no 1

The data in the table are taken from a survey of the diet of 1368 men and 1540 women in total 2848 adults in a region of Pakistan. The numbers of men and women surveyed were divided, separately, into four equal parts on the basis of their vegetables consumption. These parts are shown in Q4, Q3, Q2 and Q1. The mean consumption in grams per day is given for each food type in each other part for men and women separately. For example, the mean consumption of fruit by men who are the lowest amount of fresh vegetables is 31 grams per day. The columns headed SE give the standard errors of the food consumptions by all men and women.

a. Calculate the overall mean consumption of fresh vegetables, fruits, rice, fish and meat for men and women separately.

Men (sample size 1308)

	Q4 Mean	Q3 Mean	Q2 Mean	Q1 Mean	S.E
Freshveg	204	259	266	317	0.9
Fruit	31	45	69	105	0.5
Rice	367	337	269	246	01.0
wheatflour	79	114	197	253	1.0
wholegrain	2	2	6	27	0.1
Rootveg	7	11	16	29	0.01
Meat	70	61	69	77	0.04
Fish	23	28	31	44	0.2
Milk	2	3	23	39	0.3

Women (sample size 1540)

	Q4 Mean	Q3 Mean	Q2 Mean	Q1 Mean	S.E
Freshveg	178	235	266	304	0.8
Fruit	28	46	70	121	0.4
Rice	315	276	243	220	0.8
wheatflour	56	118	141	180	0.8
wholegrain	1	3	6	22	0.1
Rootveg	6	12	17	28	0.1
Meat	48	43	54	63	0.3
Fish	19	21	28	46	0.2
Milk	1	4	15	48	0.3

9. Calculate the overall mean consumption of fresh vegtables. fruits, rice, fish, and meat for men and women separately.

FOR MEN:-
FRESH VEGTABLES:-

204	Data
259	
266	Mean - sum of all points,
317	Number of Data Points.

$$\bar{X} = \frac{X_1 + X_2 + X_3 + X_4}{N}$$

$$Mean \bar{X} = \frac{204 + 259 + 266 + 317}{4}$$

$$Mean \bar{X} = \frac{1046}{4}$$

Mean $\bar{X}$ = 261·5 Ans.

FRUIT:-

| 31 |
| 45 |
| 69 |
| 105 |

$$\bar{X} = \frac{X_1 + X_2 + X_3 + X_4}{4}$$

$$Mean \bar{X} = \frac{31 + 45 + 69 + 105}{4}$$

$$Mean \bar{X} = \frac{250}{4}$$

Mean(x) = 62.5 Ans.

RICE :- 367 + 337 + 269 + 246

$$\frac{}{4}$$

367	
337	
269	
246	

Mean(x) = $\dfrac{367 + 337 + 269 + 246}{4}$

Mean(x) = $\dfrac{1,219}{4}$

Mean(x) = 304.75 Ans.

wheat floor :-

79	
114	
1097	
253	

Mean(x) = $\dfrac{79 + 114 + 1097 + 253}{4}$

Mean(x) = $\dfrac{643}{4}$

Mean(x) = 160.75 (Ans)   Pg: ④

Mean = 160.759 Ans.

WHOLE GRAIN:-

2
2
6
27

Mean(x̄) $\frac{2+2+6+27}{4}$

Mean (x̄) = $\frac{37}{4}$

Mean(x̄)= 9.25 Ans.

ROOT VEG:-

7
11
16
29

Mean(x̄) $\frac{7+11+16+29}{4}$

Mean(x̄) $\frac{63}{4}$

Mean(x̄) 15.75

Mean $(\bar{x})$ = 15·75 Ans.

MEAT:-

70
61
69
77

Mean $(\bar{x})$ = $\dfrac{70 + 61 + 69 + 77}{4}$

Mean $(\bar{x})$ = $\dfrac{277}{4}$

Mean $(\bar{x})$ = 69·25 Ans.

FISH:-

23
28
31
44

Mean $(\bar{x})$ = $\dfrac{23 + 28 + 31 + 44}{4}$

Mean $(\bar{x})$ = $\dfrac{126}{4}$

Mean $(\bar{x})$ = 31·5.

Mean$(\bar{x})$= 31.5. Ans.

MILK:-

2
3
23
39

Mean$(\bar{x})$ $\dfrac{2+3+23+39}{4}$

Mean$(\bar{x})$ $\dfrac{67}{4}$

Mean$(\bar{x})$ 16.75.

NOW FOR WOMEN:-

FRESH VEGTABLES:-

178
235
266
304

Mean$(\bar{x})$ = $\dfrac{x_1+x_2+x_3+x_4}{N}$

Mean$(\bar{x})$ = $\dfrac{\sum x}{N}$

Putting values.

Mean$(\bar{x})$ $\dfrac{178+233+266+304}{4}$

Mean$(\bar{x})$ $\dfrac{983}{4}$

Mean$(\bar{x})$ 245.75.

Mean x̄ 245.75 Ans

FRUIT:-

| 28 |
| 46 |
| 70 |
| 121 |

Mean (x̄) = $\dfrac{28 + 46 + 70 + 121}{4}$

Mean (x̄) = $\dfrac{265}{4}$

Mean (x̄) = 66.25

RICE:-

| 315 |
| 276 |
| 243 |
| 220 |

Mean (x̄) = $\dfrac{315 + 276 + 243 + 220}{4}$

Mean (x̄) = $\dfrac{1054}{4}$

Mean x̄ = 263.5 Ans

Wheat floor:-

56
118
141
180

$$\text{Mean}(\bar{x}) = \frac{56 + 118 + 141 + 180}{4}$$

$$\text{Mean}(\bar{x}) = \frac{495}{4}$$

$$\text{Mean}(\bar{x}) = 123 \cdot 75$$

WHOLE GRAIN:-

1
3
6
22

$$\text{Mean}(\bar{x}) = \frac{1 + 3 + 6 + 22}{4}$$

$$\text{Mean}(\bar{x}) = \frac{32}{4}$$

$$\text{Mean}(\bar{x}) = 8 \cdot 00 \quad \text{Ans.}$$

ROOT VEGTABLES:-

6	
12	
17	
28	

$$\text{Mean}(\bar{x}) = \frac{6 + 12 + 17 + 28}{4}$$

$$\text{Mean}(\bar{x}) = \frac{63}{4}$$

$$\text{Mean}(\bar{x}) = 15 \cdot 75 \, \text{Ans}.$$

MEAT :-

48	
43	
54	
63	

$$\text{Mean}(\bar{x}) = \frac{48 + 43 + 54 + 63}{4}$$

$$\text{Mean}(\bar{x}) = \frac{208}{4}$$

$$\text{Mean}(\bar{x}) = 52 \cdot 00 \, \text{Ans}.$$

FISH:

19
21
28
46

$$Mean(\bar{x}) = \frac{19 + 21 + 28 + 46}{4}$$

$$Mean(\bar{x}) = \frac{114}{4}$$

$$Mean(\bar{x}) = 28.5 \ Ans.$$

MILK:-

1
4
15
48

$$Mean(\bar{x}) = \frac{1 + 4 + 15 + 48}{4}$$

$$Mean(\bar{x}) = \frac{68}{4}$$

$$Mean(\bar{x}) = 17.00 \ Ans$$

Part a sub part i-

Give the to underlying
devi standard deviation in
each case.

Standard deviation for Men
$$S = \sqrt{\frac{\sum (x-x)^2}{b}}$$

H· COMMEDITY	Standard Deviation
Fresh vegtables	46·23
Fruit	32·39
Rice	56·70
wheat floor	78·94
whole grain	11·98
Root vegtables	559·5
Meat	876·55
Fish	8·96
Milk	17·71

Standard deviation for women.

They will do by this method

$$\sqrt{\dfrac{\sum [x - \bar{x}]}{n}}^{2}$$

H. Commodity	S.D
Fresh vegtables	53.261
Fruit	40.352
Rice	41.323
Wheat floor	51.924
whole grain	9.565
Root vegtables	9.326
Meat	8.607
Fish	12.288
Milk	21.529

a- Part ii-

Calculate also the overall mean consumption of fresh vegtables, rice, fish, and meat for men and women combined.

Overall Mean Consumption of Fresh vegtables:-

Men	Women
204	178
259	235
266	266
317	304

Overall mean Consumption = $\dfrac{Men + women}{8}$

$$\bar{Y} = \frac{h_1 \bar{x}_1 + h_2 \bar{x}_2}{h_1 + h_2}$$

$$O.M.C \bar{x} = \frac{204 + 259 + 266 + 317 + 178 + 235 + 266 + 304}{8}$$

$$O.M.C \bar{x} = \frac{1755}{8} \quad \frac{2,029}{8}$$

$$O.M.C \bar{x} = 253 \cdot 625 \text{ Ans.}$$

Overall Mean Consumption of ~~Rice~~. Fruit:-

Men	Women
31	28
45	46
69	70
105	121

$$\bar{x} = \sum (x_{i\,men} + x_{i\,women})$$

$$O.M.C\;\bar{x} = \frac{31 + 45 + 69 + 105 + 28 + 46 + 70 + 121}{8}$$

$$O.M.C\;\bar{x} = \frac{515}{8}$$

$$O.M.C\;\bar{x} = 64.375 \; Ans.$$

Overall Mean consumption of Rice:-

Men	Women
367	315
337	276
269	243
246	220

$$\bar{x} = \sum (x_{i\,men} + x_{i\,women})$$

$$O.M.C\;\bar{x} = \frac{367 + 337 + 269 + 246 + 315 + 276 + 243 + 220}{8}$$

$$O \cdot M \cdot C = \frac{2273}{8}$$

$$O \cdot M \cdot C = 284 \cdot 12 \text{ Ans.}$$

Overall Mean Consumption
of wheat floor wholegrain:

Men	Women
2	1
2	3
6	6
27	22

$$\bar{x} = \Sigma(x_{i \, men} + x_{i \, women})$$

$$O \cdot M \cdot C \, \bar{x} = \frac{2 + 2 + 6 + 27 + 1 + 3 + 6 + 22}{8}$$

$$O \cdot M \cdot C \bar{x} = \frac{69}{8}$$

$$O \cdot M \cdot C \bar{x} = 8 \cdot 625$$

xxx
Overall Mean Consumption of whole grain :- ⚡ X

Overall Mean Consumption of wheat flour.

Men	Women
79	56
114	118
197	141
253	180

$$\bar{x} = \sum (x_{i\,men} + x_{i\,women})$$

$$O.\varnothing.M.C \bar{x} = \frac{79 + 114 + 197 + 253 + 56 + 118 + 141 + 180}{8}$$

$$O.M.C (\bar{x}) = \frac{1138}{8}$$

$$O.M.C (\bar{x}) = 142.25$$

Overall Mean Consumption of vegtables:-
↓Root

Men	women	
7	6	
11	12	
16	17	
29	28	$\bar{X} = \Sigma [X_1 Men + X_{wo}$
		men)

$$O.M. C(\bar{X}) = \frac{7+11+16+29+ 6+12+17+28}{8} \quad 8$$

$$O.M. C(\bar{X}) = \frac{126}{8}$$

$$O.M. C(\bar{X}) = 15.75$$

Overall Mean Consumption of fish.

Men	women	
23	19	
28	21	
31	28	
44	46	

$$O.M.C (\bar{X}) = \frac{23+28+31+ 44+ 19+21+28+46}{8}$$

$$O.M.C(\bar{x}) = \frac{240}{8}$$

$$O.M.C(\bar{x}) = 30.00$$

Over all Mean Consumption of Meat:-

Men	Women
70	48
61	43
69	54
77	63

$$\bar{x} = \frac{\Sigma(x.Men + x.Women)}{8}$$

$$O.M.C(\bar{x}) = \frac{70+61+69+77 + 48+43+54+63}{8}$$

$$O.M.C(\bar{x}) = \frac{485}{8}$$

$$O.M.C(\bar{x}) = 60.625$$

Overall Mean Consumption of Milk :-

Men	Women
2	1
3	4
23	15
39	48

$$O.M.C(\bar{x}) = \frac{2+3+23+39+1+4+15+48}{8}$$

$$O.M.C(\bar{x}) = \frac{135}{8}$$

$$O.M.C(\bar{x}) = 16.87 \text{ (Ans)}$$

Q1 Part 'B'

Describe in words what the figures for milk, root vegtables, wheat floor, consumption indicate.

The figure can be described in the following manner:

Q4 consume a mean grams of 7 for root vegtables in Men while in women in Q4 the Mean consumption of Root vegtables is 6 grams. In the similar way the other groups can be defined.

So for milk is concerned Q4 consume on the averge 2 litre for man while one litre on the average is consumed by women.

In case of wheat flour, in men first portion ie Q1 consume 79 grams on the average while women in Q4 on the average consume 56 grams. Similarly rest of the portions can be summarized.

② 25

QNO1 Part "e"

Men require, on average, about √20% more food per day than women to maintain energy levels. Use this information to compare the consumptions of the main food groups by men in Q9 and women in Q1. (You are not required to consider whole grains, root vegtables or milk.

ANSWER:-

Men	Women
Q4	Q1
79	180.

It shows that in this case, men in Q4 one use less then half of the quantity that is used by women in Q1, so we can say that the over use of 20%. by men in this case isn't happening rather man are under using.

Q2 Part C.

What distinctive pattern is there, for both men and women, in rice, fruit, and fish consumption across the four parts, Q4 to Q1?
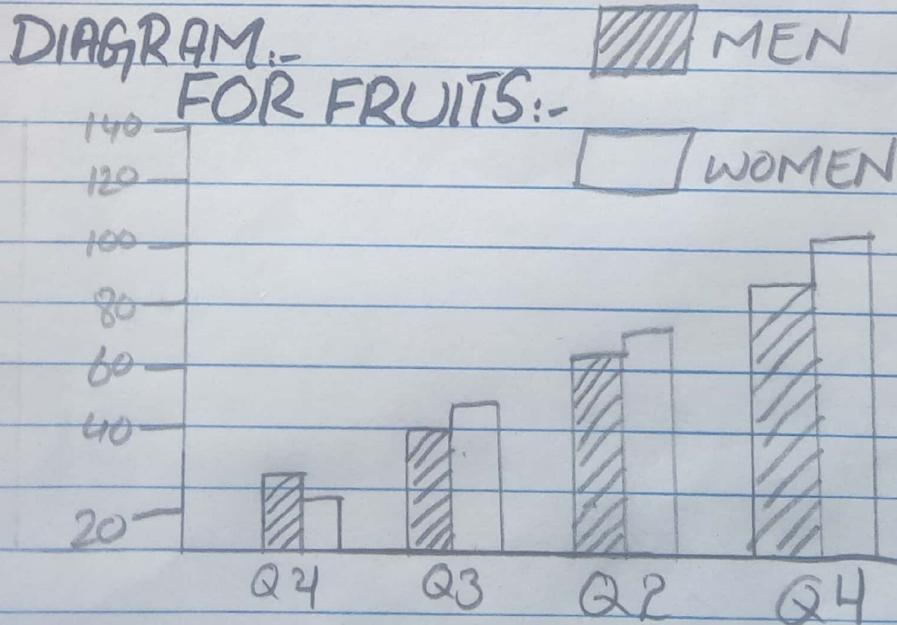
ANSWER:-

Description

The figures given in the table indicate that in Men, the consumption for fruit is increasing from Q4 towards Q1 i.e the Q4 is consuming the least amount of fruit while the Q1 is consuming the largest amount of fruit same in this situation in women i.e the trend continues there are as well. In fish man consumption also, Q4 is consuming the least amount both in Men & women while Q1 is consuming the largest quantity. This trend of increase towards from Q4 towards Q1 is also evident.

mean consumption of wheat flour both in Men & women However in rice, the trend is opposite ie Q4 is consuming towards Q1 in both Men and women.

QN01 Part d.

Draw a suitable diagram to show the difference in consumption patterns of fish and fruits b/w men and women.
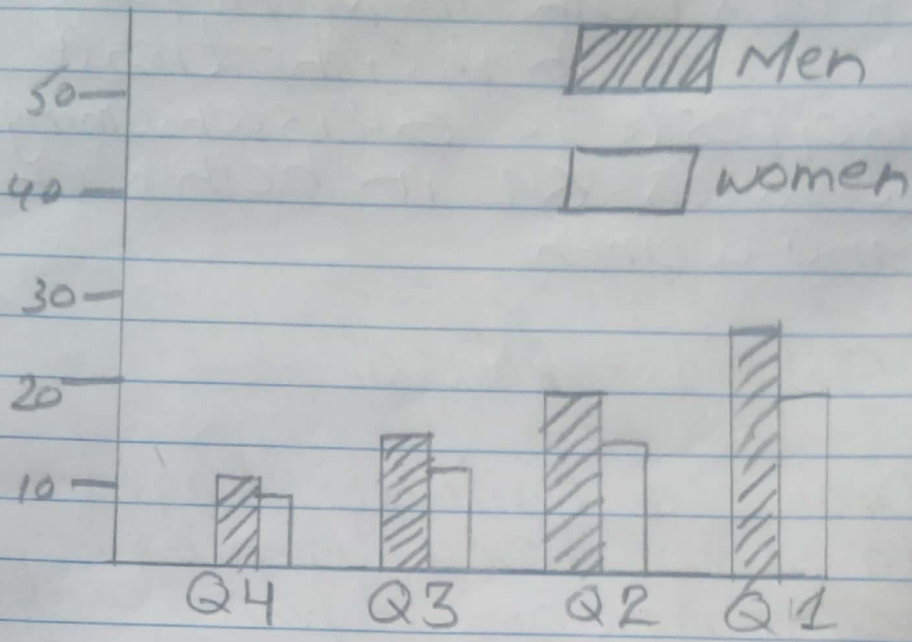
ANSWER:-

DIAGRAM:-   ▨ MEN
        FOR FRUITS:-   ☐ WOMEN

FOR FISH:-

Q NO: 1 part "f"
Explain in your own words, that the is what the standard deviation of the above commodities shows for men and women and which one show better result.

ANSWER:-
The standard variation for fresh vegtables and fruit consumption, is less in men as compared to women. We know that lesser standard deviation is desired the most so in this case men are having better standard deviation than women.

In rice consumption, the S·D standard deviation of women is lower than men hence women have better standard deviation.

Similarly in wheatflour, wheat goain, rest vegtables Men's standard deviation is higher than women while in Meat, fish & Milk, the women standard!

deviation is higher than that of Men.

Q NO: 3

a)

Find A.M, G.M, H.M, Median, Mode, Quartiles, Percentiles, Range, M.D, Q.D, Variance, Standard Deviation, Coefficient of variation, Skeweness of the following data.

Rainfall (in cm)	No of year
20-24	1
25-29	3
30-34	5
35-39	8
40-44	5
45-49	2
50-54	0
55-59	1

Q- Find the following:-

First we prepare the following.

Rainfall (inches)	No of year f	x	fx	$f\log x$	f/x	class boundaries	cf
20-24	1	22	22	1.342	0.045	19.5-24.5	1
25-29	3	27	21	4.294	0.111	24.5-29.5	4
30-34	5	32	160	7.525	0.156	29.5-34.5	9
35-39	8	37	296	12.545	0.216	34.5-39.5	17
40-44	5	42	210	8.116	0.119	39.5-44.5	22
45-49	2	47	94	3.344	0.042	44.5-49.5	24
50-54	0	52	0	8.394	0	49.5-54.5	24
55-59	1	57	57	1.755	0.017	54.5-59.5	25
—	25	—	920	38.921	0.767		

$$A.M = \bar{x} = \frac{\Sigma fx}{\Sigma f} \quad T$$

Putting the values

$$A.M = \bar{x} = \frac{920}{25}$$

$$A.M = \bar{x} = 36.8 \text{ Ans.}$$

Day: M T W T F S   Date: / /

$$G \cdot M = \text{Antilog}\left(\frac{\Sigma f \log x}{\Sigma f}\right)$$

putting the values in the given formula.

$$G \cdot M = \text{Antilog}\left(\frac{38 \cdot 921}{25}\right)$$

$$G \cdot M = \text{Antilog}(1 \cdot 556)$$

$$G \cdot M = 0 \cdot 442 \text{ Ans.}$$

$$H \cdot M = \frac{\Sigma f}{\Sigma f/x}$$

putting the values

$$H \cdot M = \frac{25}{0 \cdot 70795}$$

$$H \cdot M = 35 \cdot 313 \text{ Ans.}$$

$$\text{Median} = l_1 + \frac{h}{f}\left(\frac{\Sigma f}{2} - c\right)$$

putting values from the above table

from the above table the

Medien class.

Median class $= \dfrac{26}{2} = 13^{th}$ values

Median class $= (34.5 - 39.5)$

$l = 34.5$, $h = 5$ $l = 9$

$$Median = 34.5 + \frac{5}{8}\left[\frac{25-9}{2}\right]$$

$$Median = 34.5 + 0.625(12.5 - 9)$$

$$Median = 34.5 + 2.187$$

Median $= 36.68$ Ans.

$\longleftarrow$ $\longrightarrow$

No   we find Mode

$$Mode = l_i + \frac{fm - f_0}{2fm - f_0 - f_1} \times h$$

Now we find Mode.

$$Mode = l_i + \frac{fm - f_o}{2fm - f_o - f_i} \times h$$

Rainfall (inches)	f	class bourdries
20-24	1	19.5-24.5
25-29	3	24.5-29.5
30-34	5	29.5-34.5
35-39	8	34.5-39.5
40-44	5	39.5-44.5
45-49	2	44.5-49.5
50-54	0	49.5-54.5
55-59.	1	54.5-59.5
	25	

By inspecting method we choose
(34.5 - 39.5) as model class
because it has maximum.
frequency. Therefore putting
values in formula.

$$\text{Mode} = 34.5 + \frac{8-5}{2(8)-5-5} \times h$$

$$\text{Mode} = 34.5 + \frac{3}{6}$$

$$\text{Mode} = 34.5 + \frac{3}{6} \times 5$$

$$\text{Mode} = 37 \text{ Ans.}$$

$\longleftarrow \qquad \longrightarrow$

Quartiles.

Rainfall inches	f	classboundries	cf
20 - 24	1	19.5 - 24.5	1
25 - 29	3	24.5 - 29.5	4
30 - 34	5	29.5 - 34.5	9
35 - 39	8	34.5 - 39.5	17
40 - 44	5	39.5 - 44.5	22
45 - 49	2	44.5 - 49.5	24
50 - 54	0	49.5 - 54.5	24
55 - 59	1	54.5 - 59.5	25
	25		

$\Sigma f = 25$ is odd

$Q1 = \left(\dfrac{\Sigma f + 1}{4}\right)^{th}$ value

$Q1 = \left(\dfrac{25 + 1}{4}\right)^{th}$ value

$Q1 = 6.5^{th}$ values

so $Q1$ lies in group $(34.5 - 39.5)$

$Q1 = li + \dfrac{h}{f}\left(\dfrac{\Sigma f}{2} - c\right)$

$Q1 = 34.5 + \dfrac{5}{8}\left(25 - 9\right)$

$Q1 = 34.5 + 10$

$Q1 = 44.5$ Ans.

$\longleftrightarrow$
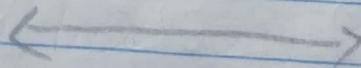
Mean deviation

Mean deviation from Mean

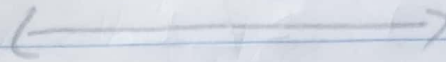$$M.D = \frac{\sum f |x - \bar{x}|}{\sum f}$$

where $\bar{x} = \frac{\sum f x}{\sum f}$

Now the necessary calculation is as.

Rainfall (inches)	f	C.B	x	f|x-x̄|	cf
20-24	1	19.5 - 24.5	22	-14.8	1
25-29	3	24.5 - 29.5	27	-29.4	4
		29.5 - 34.5	32	-24	9
30-34	5	34.5 - 39.5			
35-39	8	34.5 - 39.5	37	1.6	17
40-44	5	39.5 - 44.5	42	26	(22)
45-49	2	44.5 - 49.5	47	20.14	24
50-54	0	49.5 - 54.5	52	0	24
55-59	1	54.5 - 59.5	57	20.2	25
				1.6	

We have already calculated

$$X = 36.8$$

$$M.D = \frac{1.6}{25}$$

$$M.D = 0.064$$

$\longleftrightarrow$

Range

$$Range = X_1 - X_5$$

$$Range = 59 - 20$$

$$Range = 39 \ Ans.$$

$\longleftrightarrow$

Q.D
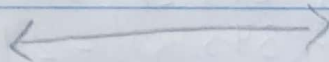
$$Q.D = \frac{Q3 - Q1}{Q3 + Q1}$$

it means Q3 lies in (39.5 - 44.5) groups

$$Q3 = 3\left[\frac{\Sigma f + 1}{4}\right]^{th}$$

$$Q3 = 3\left(\frac{25+1}{4}\right)$$

$$Q3 = 19.5th$$

it mean Q3 lies

Day. M T W T F S   Date.   /   /

$$Q3 = l_1 + \frac{h}{f}\left(\frac{3f}{4} - C\right)$$

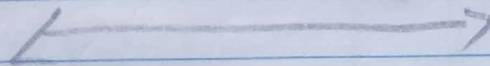$$Q3 = 39.5 + \frac{5}{5}\left(\frac{3 \times 25}{4} - 22\right)$$

$$Q3 = 36.25$$

putting the values in formula

$$QD = \frac{Q3 - Q1}{Q3 + Q1}$$

$$QD = \frac{36.25 - 44.5}{36.25 + 44.5}$$

$$QD = \frac{-8.25}{80.75}$$

$$QD = 0.102 \quad Ans.$$

Parents: Excellent ☐ Good ☐ Need Improvement

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Standard deviation

$$S = \sqrt{\frac{\sum fx^2}{\sum f} - \left(\frac{\sum fx}{\sum f}\right)^2}$$

Now we prepare the necessary calculation.

Rainfall hes	f	x	fx	fx²
20-24	1	22	22	484
25-29	3	27	81	2157
30-34	5	32	160	5320
35-49	8	37	296	50
40-44	85 42	42	210	1920
45-49	2 47	47	94	408
50-64	0	52	0	0
55-59	1	57	57	3249
	25		920	35230

putting values in formula

$$S = = \sqrt{\frac{35230}{25} - \left(\frac{920}{25}\right)^2}$$

$$S = \sqrt{1409.2 - (36.8)^2}$$

$$S = \sqrt{54.96}$$

$$S = 7.41 \text{ Ans.}$$

$\leftarrow$ —————— $\rightarrow$

Variance

$$S^2 = \frac{\sum fx^2}{\sum f} - \left(\frac{\sum fx}{\sum f}\right)^2$$

putting the values

$$S^2 = \frac{358230}{25} - \left(\frac{920}{25}\right)^2$$

$$S^2 = 1409.2 - (36.8)^2$$

$$S^2 = 54.96 \text{ Ans.}$$

$\leftarrow$ —————— $\rightarrow$

coefficient variation

$$CV = \frac{S}{\bar{X}} \times 100$$

As we have already calculated.

As = S = 7.41, X = 36.8

So

$$CV = \frac{S}{\bar{X}} \times 100$$

Putting the values

$$CV = \frac{7.41 \times 100}{36.8}$$

$$CV = \boxed{20.13} \text{ Ans.}$$

$\leftarrow$ ———————— $\rightarrow$

Skewness:-

Skewness can be measured by any formula of the three formula listing below

i- skewness by moment ratio
ii- skewness by perso"coefficient
iii- skewness by Bowley method

But here we find Skewness through karl Persons method.

$$SK = \frac{3(Mean - Median)}{S}$$

But we have already calculated Mean = 36.8, Median = 36.68, S = 7.41

putting the values in the above formula

$$SK = 3\left[\frac{(36.8) - (36.68)}{7.41}\right]$$

$$SK = -0.0485 \text{ Ans.}$$

Decile

$$D_{10} = 8\left(\frac{\Sigma f + 1}{10}\right)^{th} \text{ values}$$

$$D^{10} = 8\left(\frac{25 + 1}{10}\right)^{th} \text{ values}$$

$$D^{10} = 20 \cdot 8^{th} \text{ values.}$$

Rainfall	f	C·B	cf
20 - 24	1	19.5 - 24.5	1
25 - 29	3	24.5 - 29.5	4
30 - 34	5	29.5 - 34.5	9
35 - 39	8	34.5 - 39.5	17
40 - 44	5	39.5 - 44.5	22
45 - 49	2	44.5 - 49.5	24
50 - 54	0	49.5 - 54.5	24
55 - 59	1	54.5 - 59.9	25
	25		

$$D_{10} = (20.8)^{th} \text{ value}$$

$$\text{So } D_{10} = \text{lies } (39.5 - 44.5)$$

$$D_{10} = l + \frac{h}{f}\left(\frac{\Sigma f}{10} - C\right)$$

$$D_{10} = 39.5 + \frac{5}{5}\cdot\left(\frac{25-22}{10}\right)$$

$$D_{10} = 20 \text{ Ans.}$$

←————————→

Percentile

$$\text{As } P_i = i\left(\frac{n+1}{100}\right)^{th} \text{ value}$$

$$P_1 = 1\left(\frac{25+1}{100}\right)^{th}$$

$$P_1 = 0.26^{th} \text{ values}$$

$$\text{The } P_1 \text{ class is } (19.5 - 24.5)$$

$$P_1 = 1\left(\frac{25+1}{100} - 1\right)$$

$$P_1 = (0.26 - 1)$$
$$P_1 = -0.74 \text{ Ans.}$$

Similarly we can find up the values

$$P_{25} = 25 \left(\frac{\Sigma f + 1}{25} \right)^{th}$$

Putting the values

$$P_{25} = 26 \text{ value}$$

The prec class is.

$$P_{70} = 70 \left(\frac{\Sigma f + 1}{100} \right)^{th} \text{value}$$

$$P_{70} = 18^{th} \text{ value}$$

The P_{70} class $(39.5 - 44.5)$

$$P_{70} = l + \frac{h}{f} \left(\frac{70/25 + 1 \otimes - c}{100} \right)$$

$$P_{70} = 39.5 + \frac{5}{5} \left(\frac{1820 \ -22}{100} \right)$$

$$P_{70} = \boxed{35.7} \text{ Ans}$$

$$P_{100} = 100 \left(\frac{25 + 1}{100} \right)^{th} \text{value.}$$
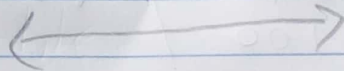
Day. M T W T F S   Date / /

$P_{100} = (20)^{th}$ value

P_{100} = Class is $(54.5 - 59.5)$

$P_{100} = 29.1 + \dfrac{f}{f}\left(\dfrac{70(25)}{100} - 25\right)$

$P_{100} = 54.5 + \dfrac{5}{1}(-6.8)$

$P_{100} = 54.5 + (-34)$

$P_{100} = 20.5$ Ans.

←————————→

QNO: 2   Part B:-

Convert the above given
data in the form of ungrouped
and then find
A·M, G·M, H·M ----- ?

22, 27, 27, 27, 32, 32, 32,
32, 32, 37, 37, 37, 37, 37, 37,
37, 42, 42, 42, 42, 42, 47, 47, 57

i- Arithmetic Mean

$$\bar{x} = \frac{\sum x}{n} = \frac{22+27+27+27+32+32+32}{32+32+37+37+37+37+37}$$
$$+37+37+37+42+42+42+$$
$$42+42+ +47 + 47+47$$
$$25$$

$$\bar{x} = \frac{920}{25} = 36\cdot8$$

$$\bar{x} = 36\cdot8.$$

2 The Geometric Mean

X	log x	X	log x
22	1.34	37	1.56
27	1.43	37	1.56
27	1.43	37	1.56
27	1.43	37	1.56
32	1.50	37	1.56
32	1.50	37	1.56
32	1.50	37	1.56
32	1.50	42	1.62
32	1.50	42	1.62
37	1.56	42	1.62
37	1.56	42	1.62
		42	1.62
		42	1.62
		47	1.67
		47	1.67
		57	1.755
		Σ	.501

$$G \cdot M = Antilog \left(\frac{\Sigma \log x}{n} \right)$$

$$G \cdot M = Antilog \left(0.2004 \right)$$

$$G \cdot M = 1.586 \ Ans.$$

8- The harmonic Mean

$$H.M = \frac{n}{\Sigma\left(\frac{1}{x}\right)}$$

X	$\frac{1}{x}$	X	$\frac{1}{x}$
22	0.45	37	0.27
27	0.37	37	0.27
27	0.37	37	0.27
27	0.37	37	0.27
32	0.31	42	0.23
32	0.31	42	0.23
32	0.31	42	0.23
32	0.31	42	0.23
32	0.31	42	0.23
37	0.27	47	0.21
37	0.27	47	0.21
37	0.27	57	0.17
		Σ	0.655

$$H.M = \frac{25}{0.655}$$

$$H.M = 38.167$$

$\longleftarrow \longrightarrow$

Day. M T W T F S   Date.   /   /
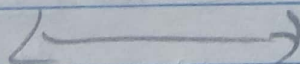
4- Median = size of the $\left[\dfrac{n+1}{2}\right]^{th}$ item

$= $ size of the $\left(\dfrac{25+1}{2}\right)^{th}$ item

$= $ size of the $\left(\dfrac{26}{2}\right)^{th}$ item

Median $= $ size of th 13th item

Median $= 37.$

5- Mode in case of indivial series the most repeated value is known as mode like

Mode $= 37.$

6- Quartile

$Q_1 = $ size of the $\left(\dfrac{n+1}{4}\right)^{th}$ item

$Q_1 = $ size of the $\left(\dfrac{25+1}{4}\right)^{th}$ item

$Q_1 = $ size of the $\dfrac{25+1}{4}^{th}$ item

$Q_1 = $ size of 6.5th item

Next page

$Q1 = 32$

$Q_2 = Median = 37$

$Q3$ size of the $3\left(\dfrac{n+1}{b}\right)^{th}$ item

$Q3 = $ size of the $3\left(\dfrac{25+1}{4}\right)^{th}$ item

$Q3 = $ size of the $3\left(\dfrac{26}{4}\right)^{th}$ item

$Q3 = $ size of the 19.5^{th} item

$Q3 = 42$

$\longleftarrow\qquad\longrightarrow$
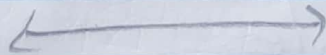
7 Decile.

$D_1 = $ size of the $\left(\dfrac{n+1}{10}\right)^{th}$ item

$D_1 = 11$ of the $\left(\dfrac{25+1}{10}\right)^{th}$ item

$D_i = 1111 \quad \left(\dfrac{26}{10}\right)^{th}$ item

$D_1 = 1111 \quad \phi = 2.6^{th}$ item

$D_1 = 27$.

D_5 = which is median is 37.

D_9 = size of the $9\left(\dfrac{n+1}{10}\right)^{th}$ item

D_9 = size of the $9\left(\dfrac{25+1}{10}\right)^{th}$ item

D_9 = size of the $9\left(\dfrac{26}{10}\right)^{th}$ item

D_9 = 111 of 23.4th item

D_9 = 47

$\longleftrightarrow$

8 Percentile.

P_1 = size of the $\left(\dfrac{n+1}{100}\right)^{th}$ item

P_1 = size of the $\left(\dfrac{25+1}{100}\right)^{th}$ item

P_1 = size of the $\left(\dfrac{26}{100}\right)^{th}$ item

P_1 = size of the 0.26^{th} item

P_1 = 22.

P_{50} = median = 37

Note there 99 percentile.

P_{70}

P_{99} = size of the $99\left(\dfrac{n+1}{100}\right)^{th}$ item

P_{99} = size of the $99\left(\dfrac{25+1}{100}\right)^{th}$ item

P_{99} = size of the 25.74^{th} item

P_{99} = ~~59~~ 57.

↪ ⟶
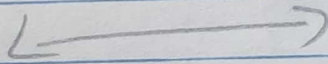
9 The Range

smallest value = 22

largest value = 57

Range = $L - S = 57 - 22 = 35$

Range = 35

↪ ⟶

Day. M T W T F S   Date. mean = $\bar{X}$ 23.8
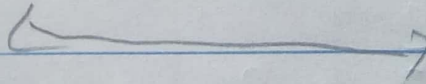
10 The mean deviation

$$M.D = \frac{\Sigma [X - mean]}{4}$$

X	[X mean
22	+ 14.8
27	+ 9.8
27	+ 9.8
27	+ 9.8
32	+ 4.8
32	+ 4.8
32	+ 4.8
32	+ 4.8
32	+ 4.8
37	0.2
37	0.2
37	0.2
37	0.2
37	0.2
37	0.2
37	0.2
37	0.2
42	5.2
42	5.2
42	5.2
42	5.2
42	5.2
47	10.2
47	10.2
57	20.2
Σ	110.4

29.4

24

1.6

26

20.4

$$M.D = \frac{110.4}{25}$$

$$M.D = 4.416$$

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11 The Quartile deviation

$$QD = \frac{Q3 - Q1}{2} = \frac{42 - 33}{2} = \frac{10}{2}$$

$$QD = 05$$

$$\longleftrightarrow$$
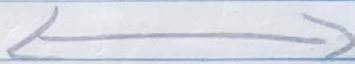
12 The variance

$$S^2 = \frac{\sum (x - \bar{x})^2}{n} \implies \frac{\sum^2}{4} - \left(\frac{\sum x}{4}\right)^2$$

X	X2		X	X²	
22	4 84		37	1369 ⌉	
27	729 ⌉	2187	42	1764	
27	729		42	1764	8820
27	8729 ⌋		42	1764	
32	10 24 ⌉		42	1764	
32	10 24	5120	42	1764 ⌋	
32	10 24		47	2209 ⌉	
32	1024		47	2209 ⌋	4418
32	1024 ⌋		57	3249.	
37	1369 ⌉		₤	35230.	
37.	1369	10452			
37	1369				
37	1369				
37	1369				
37	1369				
37	1369 ⌋				

$$S^2 = \frac{\sum x^2}{4} - \left(\frac{\sum x}{4}\right)^2$$

$$S^2 = 35230 - (36.84)^2$$

$$S^2 = 1409.2 - 1354.24$$

$$S^2 = 54.96.$$

$$\sqrt{S^2} = \sqrt{54.96}$$

14   co-efficient of variation

$$S^2 \cdot d = 3.80 \, Ans.$$

$$\longleftrightarrow$$

Co-efficient of variation

$$C \cdot V = \frac{S \cdot d \times 100}{\overline{X}}$$

$$C \cdot V = \frac{3.80 \times 100}{36.8}$$

$$C \cdot V = 10.32.$$

$$\longleftrightarrow$$

15 - Skewness.

The pearson of skewness

$$SK = \frac{3(Mean - Median)}{S.d}$$

$$SK = 3 \left[36.8 - 37 \Rightarrow But\ 36.8 = 37 \right.$$

$$SK = 3 \left[\frac{37 - 37}{3.8} \right] = 0$$

SK = The dist is postivel.
skewed or symmetrical.

QNO.2

In the united Kingdom there has been a national census. every 10 years since 1801 (with the exception of 1941. At the time of the 2011 UK census · · · · · ?

PART A:-
Describe the purpose of census.

ANSWER

PURPOSE OF CENSUS:-

The word census is derived from the Latin word 'censere' which become "census" in english.
Census means "official counting".

A census aims to count the entire population of a country and at the location where each person usually lives. The census ask questions of people in homes and group living situations including how many people live or stay in each home, and the

sex, age and race of each person.

A census is the procedure of systemically acquiring and recording information.

Q NO: 2 Part b.

Explaining how it differs from a sample survey and from routine collected of date by government agencies.

ANSWER:-

DIFFER FROM SAMPLE SURVEY:-

In the sample survey we go through some of the selected part from the population. The concern is about the information is totally base on the selected data. This procedure is done by government agencies, they give the data by picking some selected part part of the population but in census procedure.

it is compulsory to go through from the every object of the population. that is why census is differs from sample survey.

Q2 Part C.

The 2011 UK census attracted a response data of about 94% of the population. Discuss whether or not that is a problem from the accuracy of the census.
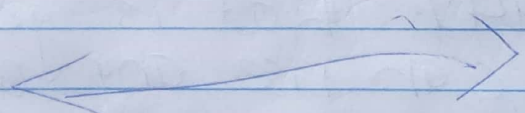
ANSWER:-

From the given information 2011 UK census attracted a response rate of 94%. that is good. But it can rise any error or may increase error further.

Because the census procedure were not performed in the correct way that why the error occur in the counting of population.

QNO:2 Part d.

In the 2011 UK census, almost 17000 people stated their religion as 'Jedi knight'. (Jedi knights are characters in the 'star wars' films.

ANSWER:-

In the census about asking specific religion from each object or group may use its harsh behaviour or many mishappen. It is the possible that some one so not like to answer of these kinds of questions. They will ask these questions indival for each object or person,

QNO: 2

Part: e

Discuss the potential problems in counducting the 2021 UK census online, and Explain how these problems might be overcome.

ANSWER:-

There is a lot of potential problem in conducting the 2021 UK census online. There is a first main issue issu is that the availability of online cend connection and internel to every person of the country is almost impossible. because in every where is not available the net connection.

The se second thing that also can increase. incruse is the personal behaviour. of persons. If the personal behaviour of the person is good then they will conduf the good census from the

from People.
The only way to overcome this problem to giving the com connection to the whole coost country. They will make sure and punctual to every person to give the respone. They will important to give response to census who census.

QNO: 2 Part f:-

Discuss the potential problems in incorperating additional data held by government agencies.

ANSWER:-
The census, itself mean the study of every object under the observation And that is real such a difficult task to do. This is also quite difficult to Government agencies to go to every single person and collect the whole alot of data/ things that have been done by these agencies.

not any to without
our copd coporation
of the people that is
done is more difficult.

←——————————→