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Q NO: 3 :- # Given Data

Rainfall (inches)	Number of years
20 - 24	1
25 - 29	3
30 - 34	5
35 - 39	8
40 - 44	5
45 - 49	2
50 - 54	0
55 - 59	1

Solution :-

Rainfall	x	f	fx	log xi	f log xi
20 - 24	22	1	22	1.342	1.342
25 - 29	27	3	81	1.43	4.29
30 - 34	32	5	16.0	1.50	7.5
35 - 39	37	8	296	1.56	12.48
40 - 44	42	5	210	1.62	8.1
45 - 49	47	2	94	1.67	3.34
50 - 54	52	0	0	1.71	0
55 - 59	57	1	57	1.75	1.75
		$\Sigma f = 25$	$\Sigma fx = 920$		38.807

(i) ∴ A.M = ?

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

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

$$A.M = \boxed{36.8}$$

(ii) ∴ G.M = ?

$$G.M = \text{Anti-log}\left[\frac{\Sigma f \log x}{\Sigma f}\right]$$

$$= A.\log\left[\frac{38.802}{25}\right]$$

$$G.M = \boxed{36.07}$$

(iii) H.M

(iii) H.M = ?

x_i	f_i	f_i/x_i
22	1	0.045
27	3	0.111
32	5	0.156
37	8	0.21
42	5	0.11
47	2	0.042
52	0	0
57	1	0.0175
	25	0.6915

$$H.M = \frac{\Sigma f_i}{\Sigma f_i/x_i}$$

$$= \frac{25}{0.6915}$$

$$H.M = \boxed{36.153}$$

(iv) Median = ?

Median formula

$$\text{Median} = L_1 + \frac{h}{f}\left(\frac{n}{2} - c\right)$$

x	f	comulative f	Rainfall (xi)
22	1	1	19.5 – 24.5
27	3	4	24.5 – 29.5
32	5	9	29.5 – 34.5
37	8	17	34.5 – 39.5
42	5	22	39.5 – 44.5
47	2	24	44.5 – 49.5
52	0	24	49.5 – 54.5
57	1	25	54.5 – 59.5

Now $\frac{n}{2} = \frac{25}{2} = 12.5$

PQ #⑤

class boundries 34.5 – 39.5

$L = 34.5$

$h = 5$, $n/2 = 12.5$

$f = 8$, $C = 9$

$$\text{Median} = l + \frac{h}{f}\left(\frac{n}{2} - C\right)$$

$$\text{Median} = 34.5 + \frac{5}{8}(12.5 - 9)$$

$$\text{Median} = \boxed{36.6875}$$

(V) Mode = ?

$$\text{Mode} = l_1 + \frac{f_m - f_{m-1}}{2f_m - f_1 - f_2} \times h \longrightarrow (A)$$

$l_1 = 34.5$, $f_m = 8$, $f_1 = 5$, $f_2 = 5$

$h = 5$

Put the value in the above equation (A)

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

$$\text{mode} = 34.5 + \frac{3}{16-10} \times 5$$

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

$$\text{mode} = \boxed{37}$$

(vi) $\Rightarrow$ Quartiles = ?

$\Rightarrow$ $Q_i = L + \frac{h}{f}\left(\frac{n \times i}{4} - c.f\right)$

NOW;

$\Rightarrow$ $Q_i = L + \frac{h}{f}\left(\frac{n \times 1}{4} - c.f\right)$

first of all we here to calculate the Quartile class

$\Rightarrow$ Quartile class Q_1 = Size of $\frac{1(25+1)}{4}$ th item

$\Rightarrow$ class containing Q_1 = Size of 7th item

$\Rightarrow$ class containing $Q_1 = 29.5 - 34.5$

$$\Rightarrow Q_1 = L + \frac{h}{f}\left(\frac{n \times 1}{4} - c.f\right)$$

$$\Rightarrow Q_1 = 29.5 + \frac{5}{5}\left(\frac{25 \times 1}{4} - 4\right)$$

$$\Rightarrow Q_1 = \boxed{31.75}$$

2)

Q_2 = 2nd Quartile = Median And median is already calculated which is 36.71

$$\therefore \boxed{Q_2 = 36.71}$$ Answer

3)

$$Q_3 = L + \frac{h}{f}\left(\frac{h \times 3}{4} - c.f\right)$$

Now Ist of all we have to compate the class having "Q_3"

:- class containing Q_3 = Size of $\frac{3(n+1)}{4}$th item

class containing Q_3 = Size of $\frac{3(25+1)}{4}$th item

class containing Q_3 = Size of "20th" item

class containing $Q_3 = 39.5 - 44.5$ OR

$$\Rightarrow Q_3 = L + \frac{h}{f}\left(\frac{n \times 3}{4} - c.f\right)$$

$$\Rightarrow Q_3 = 39.5 + \frac{5}{5}\left(\frac{25 \times 3}{4} - 17\right)$$

$$\Rightarrow Q_3 = 39.5 + 1(1.75)$$

$$\Rightarrow Q_3 = \boxed{41.25}$$ Answer

(7) Deciles = ?

$$\Rightarrow Di = L + \frac{h}{f}\left(\frac{n \times i}{10} - c.f\right)$$

$$\Rightarrow Di = \text{Size of } \left(\frac{n}{10}\right)^{th} \text{ observation}$$

$$\Rightarrow Di = \text{Size of } \left(\frac{25}{10}\right)^{th} \text{ observation}$$

$$\Rightarrow Di = 2.5^{th} \text{ observation.}$$

2.5^{th} fall in 2nd row

$$l_1 = 24.5, \quad h = 5, \quad f = 3, \quad c = 1$$

$$Di = l_1 + \frac{h}{f}\left(\frac{n}{10} - c\right)$$

$$Di = 24.5 + \frac{5}{3}(2.5 - 1)$$

$$Di = \boxed{27}$$

2) $D_2 = L + \frac{h}{f}\left(\frac{n \times 2}{10} - c.f\right)$

$\Rightarrow$ Decile class = size of $\frac{2(n+1)^{th}}{10}$ item

$\Rightarrow$ class containing D_2 = size of $\frac{2(25+1)^{th}}{10}$ item

$\therefore$ class containing D_2 = size of 5^{th} item

$\Rightarrow$ class containing D_2 = 29.5 — 34.5

$\Rightarrow D_2 = 29.5 + \frac{05}{05}\left(\frac{25 \times 2}{10} - 04\right)$

$\Rightarrow D_2 = 29.5 + 1(1)$

$\Rightarrow \boxed{D_2 = 30.5}$

3)

$$D_3 = L + \frac{h}{f}\left(\frac{n\times 3}{10} - c.f\right)$$

Now; class containing D_3 = Size of $\frac{3(n+1)^{th}}{10}$ item

$\Rightarrow$ class Containing D_3 = Size of $\frac{3(25+1)^{th}}{10}$ item

$\Rightarrow$ class Containing D_3 = Size of 8^{th} item

$\Rightarrow$ class Containing D_3 = 29.5 — 34.5

$\Rightarrow D_3 = L + \frac{h}{f}\left(\frac{n\times 3}{10} - c.f\right)$

Where; $L = 29.5$, $h = 05$, $f = 05$

$n = 25$, $c.f = 04$

$\Rightarrow D_3 = 29.5 + \frac{05}{05}\left(\frac{25\times 3}{10} - 04\right)$

$\Rightarrow D_3 = 29.5 + 1(3.50) = 33$

$\Rightarrow \boxed{D_3 = 33}$ Answer

(08) Percentiles :

$$\rightarrow P = l + \frac{h}{f}\left(\frac{nxi}{100} - c.f\right)$$

1) $\rightarrow P_1 =$ Size of $\left(\frac{25}{100}\right)^{th}$ observation

$\rightarrow P_1 =$ Size of $(0.25)^{th}$ observation fall in first row,

$l = 19.5$, $h = 5$, $f = 1$, $\frac{n}{100} = 0.25$

$C = 1$.

$$\rightarrow P_1 = 19.5 + \frac{5}{1}(0.25 - 1)$$

$$\rightarrow \boxed{P_1 = 15.75}$$

2)

$$\Rightarrow P_{10} = L + \frac{h}{f}\left(\frac{n \times 10}{100} - c.f\right)$$

$\rightarrow$ $P_{10} =$ Size of $\frac{10(n+1)^{th}}{100}$ item

$\rightarrow$ $P_{10} =$ Size of 3rd item

→ P_{10} = Size of $\frac{10(25+1)^{th}}{100}$ item

→ class containing P_{10} = 24.5 — 29.5

⇒ $P_{10} = L + \frac{h}{f}\left(\frac{n \times 10}{100} - c.f\right)$

→ $P_{10} = 24.5 + \frac{05}{03}\left(\frac{25 \times 10}{100} - 1\right)$

⇒ $P_{10} = 24.5 + 1.67\ (1.50)$

⇒ $\boxed{P_{10} = 27.01}$ answer

2)

⇒ $P_{30} = L + \frac{h}{f}\left(\frac{n \times 30}{100} - c.f\right)$

⇒ P_{30} = Size of $\left(\frac{25 \times 30}{100}\right)$ observation

⇒ P_{30} = Size of $30\left(\frac{25 \times 1}{100}\right)$ observation,

fall in 8th row.

⇒ class containing P_{30} = 29.5 — 34.5

$$\Rightarrow \quad P_{30} = 29.5 + \frac{05}{05}\left(\frac{25 \times 30}{100} - 04\right)$$

$$\Rightarrow \quad P_{30} = 29.5 + 1\,(3.5)$$

$$\Rightarrow \quad \boxed{P_{30} = 33} \quad \text{Answer}$$

3)

$$\Rightarrow \quad P_{75} = L + \frac{h}{f}\left(\frac{n \times 75}{100} - c.f\right)$$

$$\Rightarrow \quad P_{75} = \text{Size of } \frac{75(25+1)^{th}}{100} \text{ observation}$$

$$\Rightarrow \quad P_{75} = \text{Size of } \frac{75(25+1)^{th}}{100} \text{ observation fall in 20th row.}$$

$$\Rightarrow \quad \text{Class containing } P_{75} = 39.5 - 44.5$$

$$\Rightarrow \quad P_{75} = 39.5 + \frac{05}{05}\left(\frac{25 \times 75}{100} - 17\right)$$

$$\Rightarrow \quad \boxed{P_{75} = 41.25} \quad \text{Answers.}$$

4)

$$P_{99} = l + \frac{h}{f}\left(\frac{99 \times n}{100} - cf\right)$$

$\Rightarrow$ P_{99} = Size of $\left(\frac{99 \times 25}{100}\right)^{th}$ observation

$\Rightarrow$ P_{99} = Size $(24.75)^{th}$ observation, fall in 6th row

$\Rightarrow$ class containing $P_{99} = 44.5 - 49.5$

$l = 44.5$, $f = 2$, $h = 5$, $cf = 22$

$$\frac{99n}{100} = 24.75$$

$\Rightarrow$ $$P_{99} = 44.5 + \frac{5}{2}(24.75 - 22)$$

$\Rightarrow$ $$\boxed{P_{99} = 51.375}$$

(9) Range = ?

Rain fall	class boundries
20 – 24	19.5 — 24.5
25 – 29	24.5 — 29.5
30 – 34	29.5 — 34.5
35 – 39	34.5 — 39.5
40 – 44	39.5 — 44.5
45 — 49	44.5 — 49.5
50 — 54	49.5 — 54.5
55 — 59	54.5 — 59.5

$\Rightarrow$ Range = $x_L - x_S$

$\Rightarrow$ Range = 59 − 20 = 39

$\Rightarrow$ **Range = 39** Answer

(10) M.D = ?

$\Rightarrow$ $M.D = \dfrac{\Sigma f_i |x_i - \bar{x}|}{n}$

M.D

x	f	$\lvert x_i - \bar{x} \rvert$	$f\lvert x_i - \bar{x} \rvert$
22	1	$22 - 36.8 = 14.8$	14.8
27	3	9.8	29.4
32	5	4.8	24
37	8	0.2	1.6
42	5	5.2	26
47	2	10.2	20.4
52	0	15.2	0
57	1	20.2	20.2
	25	80.4	$\Sigma f\lvert x_i - \bar{x} \rvert = 136.4$

$$\Rightarrow \quad M.D = \frac{\Sigma f \lvert x_i - \bar{x} \rvert}{\Sigma f}$$

$$\Rightarrow \quad M.D = \frac{136.4}{25}$$

$$\Rightarrow \quad M.D = 5.456$$

(11) = Q.D = ?

$$\Rightarrow \quad Q.D = \frac{Q_3 - Q_1}{2}$$

$$\Rightarrow \quad Q.D = \frac{41.25 - 31.75}{2}$$

$$\Rightarrow \quad \boxed{Q.D = 4.75}$$

(12)

Variance = ?

$$\Rightarrow \quad S_2 = \frac{\Sigma f x^2}{n} - \left(\frac{\Sigma f x}{n}\right)^2$$

x	f	fx	fx^2
22	1	22	484
27	3	81	2187
32	5	160	5120
37	8	296	10952
42	5	210	8820
47	2	94	4418
52	0	0	0
57	1	57	3249
		920	35230

$$\Rightarrow S^2 = \frac{\Sigma fx^2}{n} - \left(\frac{\Sigma fx}{n}\right)^2$$

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

$$\Rightarrow S^2 = 1409.2 - 1354.24$$

$$\Rightarrow \boxed{S^2 = 54.96}$$ Answer.

(13)

Standard deviation:

$$\therefore S.D = \sqrt{\text{Variance}}$$

$$\Rightarrow S.D = \sqrt{54.96}$$

$$\Rightarrow \boxed{S.D = 7.41}$$ Answers.

(14) Co-efficient of Variance:

$$\Rightarrow C.V = \frac{S.D}{\bar{x}} \times 100$$

where $S.D = 7.41$ & $\bar{x} = 36.80$

$$\Rightarrow C.V = \frac{7.41}{36.80} \times 100 = 20.14$$

$$\Rightarrow \boxed{C.V = 20.14}$$

(15)

Skewness = ?

$$\Rightarrow \text{Skewness} = \frac{\text{Mean} - \text{Mode}}{\text{S.D}}$$

$$\Rightarrow \text{Skewness} = \frac{36.8 - 37}{7.41}$$

$$\Rightarrow \boxed{\text{Skewness} = -0.027}$$

Q NO : 2 part "B"

→ Convert the data into ungrouped data

So we take only rainfall column.

Rainfall	x_i
20 – 24	$\frac{20+24}{2} = \frac{44}{2} = 22$
25 – 29	27
30 – 34	32
35 – 39	37
40 – 44	42
45 – 49	47
50 – 54	52
55 – 59	57

(1) A.M

Here

$x_i = 22, 27, 32, 37, 42, 47, 52, 57$

So we know that

$$A.M = \frac{\Sigma x_i}{n}$$

$$A.M = \frac{22+27+\cdots\cdots+57}{8} = \frac{316}{8} = 39.5$$

$$\boxed{A.M = 39.5}$$

(2) G.M = ?

we know that

$$G = \sqrt[n]{x_1 \cdot x_2 \cdots \cdots x_n} \qquad n = 8$$

$$G = \sqrt[8]{22 \times 27 \times 32 \times 37 \times 42 \times 47 \times 52 \times 57}$$

Taking log on both side

$$\log G = \log (22 \times 27 \times 32 \times 37 \times 42 \times 47 \times 52 \times 57)^{1/8}$$

$$\log G = \frac{1}{8} \log [22 \times 27 \times 32 \times 37 \times 42 \times 47 \times 52 \times 57]$$

$$\log G = \frac{1}{8} [\log 22 + \log 27 + \log 32 + \log 37 + \log 42 + \log 47 + \log 52 + \log 57]$$

$$\log G = \frac{1}{8} [1.35 + 1.432 + 1.506 + 1.569 + 1.624 + 1.673 + 1.717 + 1.756]$$

$$\log G = \frac{1}{8} [12.627]$$

$$\log G = 1.578$$ Taking Antilog both side

$$\text{Antilog}[\log G] = \text{Antilog}[1.578$$

$$\boxed{G = \text{Antilog } 1.578}$$ Answer

(3) $H.M = ?$

Formula

$$\Rightarrow H.M = \frac{n}{\sum_{i=1}^{n} \frac{1}{x_i}} \qquad n = 8$$

$$\Rightarrow H.M = \frac{8}{\frac{1}{22} + \frac{1}{27} + \frac{1}{32} + \frac{1}{37} + \frac{1}{42} + \frac{1}{47} + \frac{1}{52} + \frac{1}{57}}$$

$$\Rightarrow H.M = \frac{8}{0.046 + 0.038 + 0.032 + 0.028 + 0.024 + 0.022 + 0.020 + 0.018}$$

$$\Rightarrow H.M = \frac{8}{0.408}$$

$$\Rightarrow \boxed{H.M = 19.608}$$ Answer

(4) Median = ?

As we know that formulma for median

Data

$xi = 22, 27, 32, 37, 42, 47, 52, 57$

$$\text{Median} = \frac{37+42}{2}$$

$$\text{Median} = \frac{79}{2}$$

$$\boxed{\text{Median} = 39.5}$$ Answer

5) Mode = ?

Mode definition = A value which occurs most frequently in a set of data. A set of data may have more than one mode or no mode at all when each observation occurs the same number of time. So there are all the same number are same time.

$x = 22, 27, 32, 37, 42, 47, 52, 57$

(6) Quartile = ?

Formula

$$Q_1 = \frac{n+1}{4}, \quad Q_3 = \frac{3(n+1)}{4}$$

Data 22, 27, 32, 37, 42, 47, 52, 57

$n = 8$

$$Q_1 = \frac{n+1}{4}$$

$$Q_1 = \frac{8+1}{4}$$

$$Q_1 = \frac{9}{4}$$

$$Q_1 = 2.25$$

$$Q_1 = 2\text{th} + 0.25\,(3\text{rd} - 2\text{nd})$$

$$Q_1 = 27 + 0.25\,(32 - 27)$$

$$Q_1 = 27 + 0.25\,(5)$$

$$\boxed{Q_1 = 28.25}$$

$$Q_3 = \frac{3(n+1)}{4} = \frac{3(8+1)}{4}$$

$$Q_3 = \frac{27}{4} = 6.75$$

$$Q_3 = 6^{th} + 0.75(7^{th} - 6^{th})$$

$$Q_3 = 47 + 0.75(52 - 47)$$

$$Q_3 = 47 + 0.75(5)$$

$$\boxed{Q_3 = 50.75}$$

(7) Decile = ?

Decile formula.

$$D_3 = 3\left(\frac{n+1}{10}\right) \qquad n = 8$$

$$D_3 = 3\left(\frac{8+1}{10}\right) = \frac{27}{10}$$

$$D_3 = 2.7$$

Pg # (27)

$$D_3 = 2nd + 0.7(3rd - 2nd)$$

$$D_3 = 27 + 0.7(32 - 27)$$

$$D_3 = 27 + 0.7(5)$$

$$\boxed{D_3 = 30.5}$$

$$D_7 = 7\frac{(n+1)}{10} = \frac{7(9)}{10} = \frac{63}{10} = 6.3$$

$$D_7 = 6^{th} + 0.3(7^{th} - 6^{th})$$

$$D_7 = 47 + 0.3(52 - 47)$$

$$D_7 = 47 + 0.3(5)$$

$$\boxed{D_7 = 48.5}$$

Pg # (28)

(8) Percentile = ?

Formula

$$P = \frac{K(n+1)}{1000} \qquad n = 8$$

$$P_{15} = \frac{15(n+1)}{100} = \frac{15(8+1)}{100} = \frac{15(9)}{100}$$

$$P_{15} = \frac{135}{100} = 1.35$$

$$P_{15} = 1st + 0.35(2nd - 1st)$$

$$P_{15} = 22 + 0.35(27 - 22)$$

$$\boxed{P_{15} = 23.75}$$

$$*\text{-}\ P_{82} = \frac{82(9)}{100} = \frac{738}{100} = 7.38$$

$$P_{82} = 7th + 0.38(8th - 7th)$$

$$P_{82} = 52 + 0.38(57 - 52)$$

$$\boxed{P_{82} = 53.9}$$

(9) Range = ?

Formula

R = large − small

small = 22 , large = 57

$R = 57 - 22$

$\boxed{R = 35}$

(10) M.D = ?

Formula

$$M.D = \frac{\Sigma |xi - \bar{x}|}{n}$$

Already find in part (i)

$\bar{x} = 39.5$

$$M.D = \frac{\Sigma |xi - \bar{x}|}{n}$$

$$M.D = \frac{80}{8}$$

$\boxed{M.D = 10}$

xi	$\lvert xi - \bar{x} \rvert$
32	$\lvert 32 - 39.5 \rvert = 17.5$
27	12.5
32	7.5
37	2.5
42	2.5
47	7.5
52	12.5
57	17.5
	80

(11) $Q.D = ?$

Formula

$$Q.D = \frac{Q_3 - Q_1}{2} = \frac{50.75 - 28.25}{2}$$

$$\boxed{Q.D = 11.25}$$

(12)

Variance

Formula:

$$S^2 = \frac{\Sigma xi^2}{n} - \left(\Sigma xi/n\right)^2$$

$$S^2 = \frac{13532}{8} - \left(\frac{316}{8}\right)^2$$

$$S^2 = 1691.5 - 1560.25$$

$$\boxed{S^2 = 131.25}$$

xi	xi^2
22	484
27	729
32	1024
37	1369
42	1764
47	22.09
52	2704
57	3249
316	$\Sigma xi^2 = 13532$

(13)

$C.D = ?$

$\sqrt{S^2_x} = \sqrt{131.25}$

$S = \sqrt{131.25}$

$\boxed{S = 11.46}$

(14) $C.V = ?$

Formula

$$C.V = \frac{S.D}{\bar{x}} \times 100$$

$$C.V = \frac{11.46}{39.5} \times 100$$

$\boxed{C.V = 29.01\ \%}$

(15) Skewness $= ?$

Formula

$\Rightarrow$ Skewness $= \dfrac{\text{Mean} - \text{Mode}}{S.D}$, I have no mode, so I take mode zero(0)

$\Rightarrow$ Skewness $= \dfrac{39.5 - 0}{11.46}$

$\Rightarrow \boxed{\text{Skewness} = 3.45}$

Q NO:3 END

Pg # (39)

Q NO :- 1

Answers :-

(a) * overall Mean Consumption of fresh vegetables for man :-

$$\text{AS } \bar{x}_c = \frac{n_1\bar{x}_1 + n_2\bar{x}_2 + n_3\bar{x}_3 + n_4\bar{x}_4}{n \text{ (Sample size of men)}}$$

As the sample size is divided by into four equal parts of men which is $\frac{1308}{4} = \boxed{327}$

So each group contain 327 men

$$\Rightarrow \bar{x}_c \text{ (F·V)} = \frac{327(204) + 327(259) 327(266) 327(317)}{1308}$$

$$\Rightarrow \bar{x}_{c(F\cdot V)} = \frac{342,042}{1308}$$

$$\Rightarrow \boxed{\bar{x}_{c(F\cdot V)} = 261.5}$$

* Now for fruite overall Mean Consumption for men.

$$\bar{x}_{c(\text{Fruit})} = \frac{\bar{x}_1 + \bar{x}_2 + \bar{x}_3 + \bar{x}_4}{4}$$

$$\Rightarrow \quad \bar{x}_c \text{ (fruit)} = \frac{31+45+69+105}{4}$$

$$\Rightarrow \quad \bar{x}_c = \frac{250}{4}$$

$$\Rightarrow \quad \boxed{\bar{x}_c = 62.5}$$

* overall mean Consumption of rice for men :-

$$\Rightarrow \quad \bar{x}_c(\text{Rice}) = \frac{\bar{x}_1 + \bar{x}_2 + \bar{x}_3 + \bar{x}_4}{4}$$

$$\Rightarrow \quad \bar{x}_c \text{ (rice)} = \frac{367+337+269+246}{4}$$

$$\Rightarrow \quad \boxed{\bar{x}_c \text{ (rice)} = 304.75}$$

* overall mean consumption of ~~fish~~ ~~fish~~ fish for men.

$$\bar{x}_c = \frac{23+28+31+44}{4}$$

$$\bar{x}_c = \frac{126}{4}$$

$$\boxed{\bar{x}_c = 31.5}$$

* Overall mean Consumption of meat for men.

$$\Rightarrow \quad \bar{x}_C \text{ (meat)} = \frac{70+61+69+77}{4}$$

$$\Rightarrow \quad \boxed{\bar{x}_C = 69.25}$$

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* Overall mean Consumption of fresh vegetables for women:

$$\Rightarrow \quad \bar{x}_C = \frac{n_1\bar{x}_1 + n_2\bar{x}_2 + n_3\bar{x}_3 + n_4\bar{x}_4}{n \text{ (sample size of women)}}$$

As the sample size of women = 1540
To divide into four equall group i.e:

$\frac{1540}{4}$ = 385 women in each group

$$\Rightarrow \quad \bar{x}_{C(F.V)} = \frac{178+235+266+304}{4}$$

$$\Rightarrow \quad \bar{x}_{C(F.V)} = \frac{983}{4}$$

$$\Rightarrow \quad \boxed{\bar{x}_{C(F.V)} = 245.75}$$

pg # (35)

* overall mean consumption of fruite for women :-

$$\Rightarrow \bar{x}_c = \frac{28+46+70+121}{4}$$

$$\Rightarrow \boxed{\bar{x}_c = 66.25}$$

* overall mean Consumption of Rice for women :-

$$\rightarrow \bar{x}_c = \frac{315+276+243+220}{4}$$

$$\rightarrow \bar{x}_c = \frac{1054}{4}$$

$$\rightarrow \boxed{\bar{x}_c = 263.5}$$

* overall mean Consumption of fish for women :-

$$\Rightarrow \bar{x}_c = \frac{19+21+28+46}{4}$$

$$\Rightarrow \boxed{\bar{x}_c = 128.5}$$

* overall mean consumption of meat for women :-

$$\Rightarrow \bar{x}_c = \frac{48+43+54+63}{4}$$

$$\Rightarrow \boxed{\bar{x}_c = 52}$$

* overall Standard derivation for men:-

⇒ Fresh vegetables = S.E = 09

As $S.E = \frac{S.D}{\sqrt{n}} = S.D = \sqrt{n}(S.E)$

⇒ $S.D\ (F.V) = \sqrt{1308}\ (0.9)$

⇒ $\boxed{S.D\ (F.V) = 32.55}$

⇒ Fruits =?

$S.E = 0.5$

⇒ $S.D = \sqrt{n}(S.E)$

⇒ $S.D = \sqrt{1308}\ (0.5)$

⇒ $\boxed{S.D = 13.08}$

⇒ Rice =?

$S.E = 1.0$

⇒ $S.D = \sqrt{1308}\ (1.0)$

⇒ $\boxed{S.D = 36.166}$

pg # (37)

→ Meat = ?

S.E = 0.4

⇒ S.D = $\sqrt{1308}$ (0.4)

⇒ **S.D = 14.47**

→ Fish = ?

S.E = 0.2

⇒ S.D = $\sqrt{1308}$ (0.2)

⇒ **S.D = 7.233**

* Now Standard derivation for women ?

→ Fresh Vegetables =

S.E = 0.8

As $S.E = \frac{S.D}{\sqrt{n}}$ ⇒ $S.D = \sqrt{n}(S.E)$

⇒ S.D = $\sqrt{1540}$ (0.8)

⇒ **S.D = 31.39**

Pg # (38)

→ Fruits = ?

S.E = 0.4

⇒ S.D = S.E ($\sqrt{n}$) ⇒ $\sqrt{1540}$ (0.4)

→ **S.D = 15.697**

⇒ Rice = ?

S.E = 0.8

→ S.D = $\sqrt{n}$ (S.E) ⇒ $\sqrt{1540}$ (0.8)

→ **S.D = 31.39**

→ Meat = ?

S.E = 0.3

→ S.D = $\sqrt{n}$ (S.E) ⇒ $\sqrt{1540}$ (0.3)

→ **S.D = 11.77**

⇒ Fish = ?

S.E = 0.2

→ S.D = $\sqrt{n}$ (S.E) ⇒ $\sqrt{1540}$ (0.2)

→ **S.D = 7.85**

* Now overall mean Consumpsion for Men and Women Combined.

→ Fresh ~~fruit~~ Vegetables :-

⇒ $\bar{x}_C$ (F.v for man) = 261.5

→ $\bar{x}_C$ (F.v for woman) = 245.75

Now

→ $\bar{x}_c$ (Men & Woman) = $\frac{261.5 + 245.75}{2}$

$= \frac{507.25}{2}$

→ $\bar{x}_c$ (Men & women) = 253.625

→ Rice = ?

→ $\bar{x}_c$ (Rice for man) = 304.75

→ $\bar{x}_c$ (Rice for woman) = 263.5

→ $\bar{x}_c$ (Men & Woman) = $\frac{304.75 + 263.5}{2}$

$= \frac{568.25}{2}$

→ $\bar{x}_C$ (both) = 284.125

Pg # (40)

→ Fish = ?

→ $\bar{x}_c$ (Fish for man) = 31.5

→ $\bar{x}_c$ (Fish for woman) = 28.5

→ $\bar{x}_{Combine}$ (Man & woman) = $\frac{31.5 + 28.5}{2}$

→ $\bar{x}_{Combine}$ = $\frac{60}{2}$

→ $\boxed{\bar{x}_c = 30}$

→ Meat = ?

→ $\bar{x}_{com}$ (meat for man) = 69.25

→ $\bar{x}_{com}$ (meat for woman) = 52

→ $\bar{x}_{com}$ (meat for both) = $\frac{69.25 + 52}{2}$

→ $\bar{x}_{com}$ = $\frac{121.25}{2}$

→ $\boxed{x_{com} = 60.625}$

Pg # (41)

Q NO:1 part "B"

To discribe the Consumption indication of milk, root vegetables and wheat flour.

→ i- Milk :-

→ The figure of milk consumption in men for different equall group is constantly raising from $Q_4 \longrightarrow Q_3 \longrightarrow Q_2 \longrightarrow Q_1$ means the consumption of milk in the group Q_4 if less than the group Q_3 and the consumptions of milk in group Q_3 is less than the group Q_2 and the consumption of milk in group Q_2 is less than the group Q_1.

OR, we can also show as :

The consumption of milk is equall different groups of men is

$$Q_4 < Q_3 < Q_2 < Q_1$$

we also find at that the consumption of milk in different equall group

continue

→ of mean is minimum than the other factors. Such as (fish, fruit & meat etc).

* The consumption of milk for in woman group is approximately same as the man group i.e the consumption of milk in woman group is consistantly raising from $Q_4 \rightarrow Q_3 \rightarrow Q_2 \rightarrow Q_1$

→ ii- Root Vegetables :-

The commen/argument about Root Vegetables in "b" is same as for "milk". The words "milk" will replace by the word "Root Vegetables".

→ iii - wheat flour :-

The consumption of wheat flour in men groups are also increasing from class $Q_4 \rightarrow Q_3 \rightarrow Q_2 \rightarrow Q_1$
Mean the consumption of wheat flour in Q_4 is less then the class Q_3 and consumption of wheat flour in class Q_3 is less than the Q_2 and vice versa.
i.e the consumption of wheat flower in man

$$Q_4 < Q_3 < Q_2 < Q_1$$

Pg # (43)

Part "C"

→ According to the given data the distinctive pattern is there, for both men and woman, in rice, fruit, and fish consumption across the four parts, Q_4 to Q_1.

* Female consumes more fruits as compared to male on the Average.

* on the other hand male consume rice & fish much more than females on the average.

Part "d"

Suitable diagram to make Comparison blw Average Consumption of fruit and fish blw men & Woman.

Solution :-

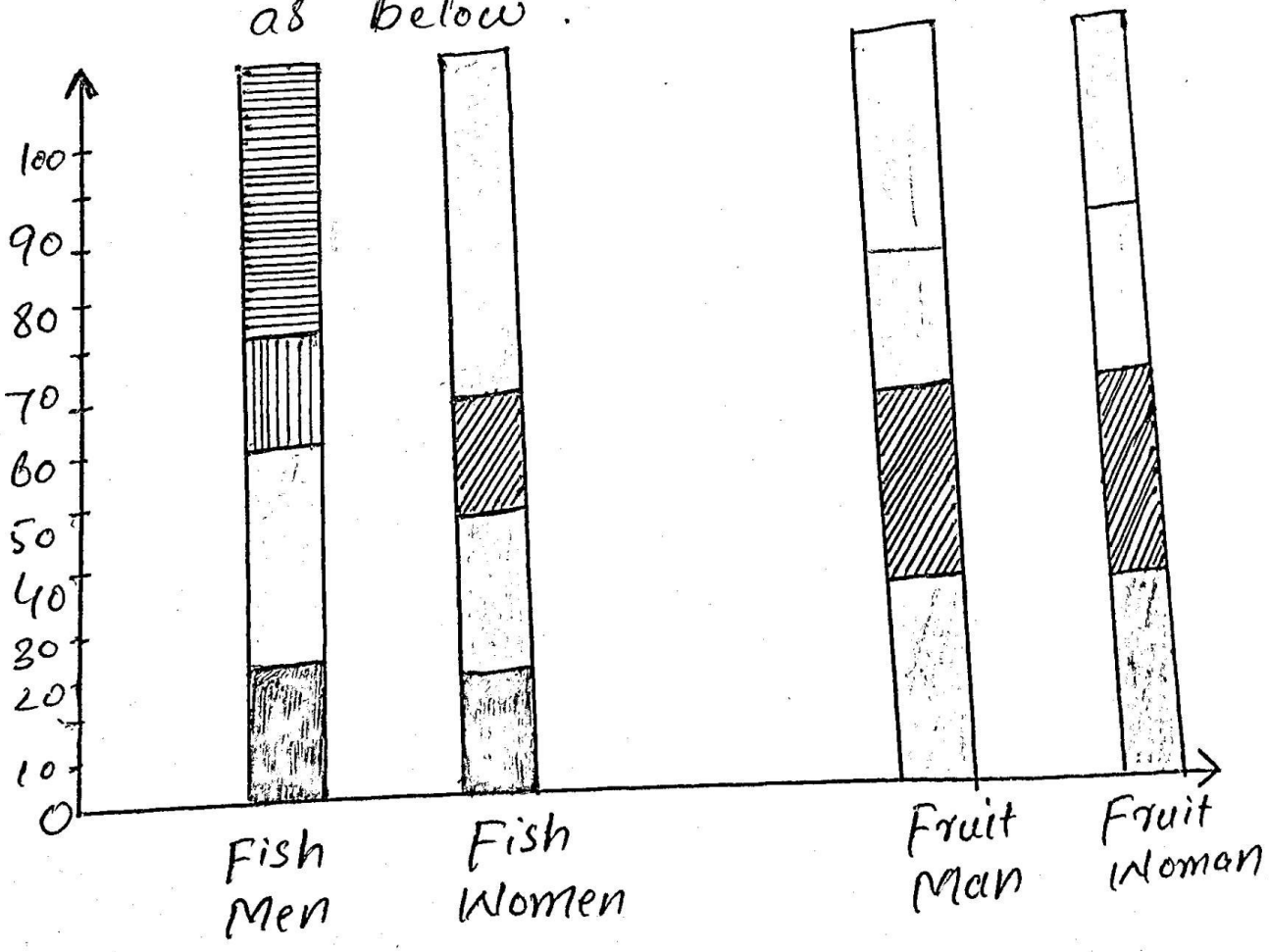
Subdivided Rectangles are Suitable in this case, weget

(below in next page)

We get

Men (fish)		Woman (fish)		Men (fruits)		Woman fruits	
Mean	%	Mean	%	Mean	%	Mean	%
23	18.3	19	16.7	31	12.4	28	10.6
28	22.2	21	18.4	45	18	46	17.4
31	24.6	28	26.4	69	27.6	70	26.4
44	34.9	46	40.4	105	42	121	45.7
126		114		250		265	

Now Sub divided Rectangles are Constructed as below.



Part "g"

→ As the Standard deviation for woman is Smaller than from the ~~Stand~~ Standard deviation of men Therefore commodities consumed by women Shower better result.

***

Q NO : 2

Answers :-

* "(a)" purpose of a Census ?

The purpose of a statistical censuses is to provide representation findings about the current state and ~~gov~~ development of the population, Economy, Society, Education, research and Environment. Census statistics form a significant base for planning, policy, development and decision making in various policy making and Bussiness Sector..

* "b" Difference blw Sample Survey & Census :-

Census method is the of statistical Enumeration where all members of the pop are studied at a more scalistic level. a Country wants to maintain

maintain information and record about all households. It surveying all households in the Country using Cenasus method. But it is not always practicle to collect information from all the unites of the population also. It is time Consuming and costly method. Thus an Easy way would be to collect data from Some representative group from the population and then make observation accordingly. This representative group which Contains Some units from the whole POP" is caued Sample.

Now when Sample data is Studied and Analyzed then it would be a Sample Survey.

Part "C"

As for as 94% response attracted Towards Census It Seems to be accurate and do not create problems towards. The accuracy of the Census but not a good practice To do So because Census by define represents the whole coverage of the population.

Part "E"

problems of conducting Cencusus online :-

An online Census is one of the Several Technological innovations that the Census has designed to respond to the challenges of Counting an increasingly large and diverse Society.

while also complying with strict cost Constraints.

Although moving to a digital plateform has its advantages but also It has risk.

The census must address key design elements to ensure that it and other are not susceptible to cyber attacks. In additions to these cyber security challenges. The move to an online system faces another that the census must overcome. The difficulties may traditionally under-counted communities.

Face accessing the internet - Racial and Ethnic minorities. Urban and Rural low income household immigrants and young children. has been historically undercounted at disproportionally. high rates.

In addition to encouraging people to respond online the bureau is also considering using Administrative records.

Administrative records to people having/who belong to racial Ethnic. Minority groups increasingly the risk of these groups being undercounted.

Part "F"

* The potential problems in incorporating additional data held by government agencies.

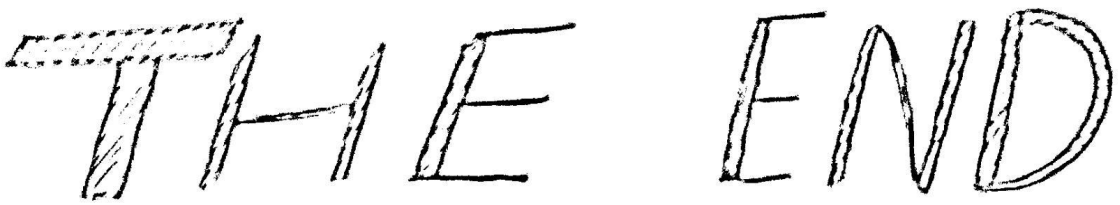
Solve of the problem :-

(i) The Seriouse problem of conducting Census through online System is Cyber Security. Therefore ~~online~~ government need to Tackle this issue Seriously and employed rained staff to Combat with this issue.

ii (2) Government Should Lounch awareness programes and lectures through electronic and print media So as to aware peoples regarding filling their Questioners online.

(iii) Govt must provide Such facilities Through which access to internet for General public is So easy.

(iv) Govt must launch Training programe and Employed Trained staff to Carried out Such as important task.


THE END