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Q1 (A) For Men:

Mean of fresh vegetables @

$$\text{Consumption} = \frac{\text{Sum of All observations}}{\text{Total Number of Observation}}$$

Now put the values

$$x = \frac{204 + 259 + 266 + 317}{4}$$

$$x = \frac{1046}{4}$$

$$x = \boxed{261.5}$$

Mean of Rice: $x = \frac{367 + 337 + 269 + 246}{4}$

$$x = \frac{1219}{4} = \boxed{304.75}$$

(P.2)

Mean of fruit:

$$x = \frac{31 + 45 + 69 + 105}{4}$$

$$x = \frac{250}{4}$$

$$x = \boxed{62.5}$$

Mean of fish:

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

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

$$x = \boxed{31.5}$$

Mean of Meat:

$$x = \frac{70 + 61 + 69 + 77}{4}$$

$$x = \frac{277}{4}$$

$$x = \boxed{69.25}$$

Now For Women:

Mean of fresh vegetables

$$x = \frac{178 + 235 + 266 + 304}{4}$$

$$x = \frac{983}{4}$$

$$x = \boxed{245.75}$$

(P.3)

= Mean of fruit:

$$x = \frac{28+41+70+21}{4}$$

$$x = \frac{265}{4}$$

$$x = \boxed{66.25}$$

Mean of Rice:

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

$$x = \frac{1054}{4}$$

$$x = \boxed{263.5}$$

Mean of fruit:

$$x = \frac{315+276+24}{4}$$

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

$$x = \frac{208}{4}$$

$$x = \boxed{52}$$

Mean of fish

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

$$x = \frac{114}{4}$$

$$x = \boxed{28.5}$$

(P. 4)

Combined mean for men

Combine rice vegetables:

$$\bar{x} = \frac{\bar{x}_1 n_1 + \bar{x}_2 n_2 + \bar{x}_3 n_3 + \dots + \bar{x}_n n_n}{n_1 + n_2 + n_3 + \dots + n_n}$$

Put the values $n_1 + n_2 + n_3 + \dots + n_n$

$$\bar{x} = \frac{[(236.5)(204) + (236.5)(252) + (236.5)(266) + (236.5)(217)]}{204 + 252 + 266 + 217}$$

$$\bar{x} = \frac{223729}{946}$$

$$\bar{x} = \boxed{236.5}$$

Mean of rice for me combine

$$\bar{x} = \frac{[(367)(304.75) + (337)(304.75) + (269)(304.75) + (246)(304.75)]}{367 + 337 + 269 + 246}$$

$$\bar{x} = \frac{371490.25}{1219}$$

$$\bar{x} = \boxed{304.75}$$

Combine

(P.5)

Combine mean of fish

$$\bar{x} = \frac{(23)(31.5) + (28)(31.5) + (31.5) + (44)(31.5)}{23 + 28 + 31 + 44}$$

$$\bar{x} = \frac{396.9}{4}$$

$$\bar{x} = \boxed{3.15}$$

Combine Mean for women

Combine mean of fresh vegetables

$$\bar{x} = \frac{(245.75)(178) + (245.75)(235) + (245.75)(266) + (245.75)(307)}{178 + 235 + 266 + 307}$$

$$\bar{x} = \frac{241572.25}{958}$$

$$\bar{x} = \boxed{245.75}$$

meat $\therefore \bar{x} = \frac{(52)(48) + (52)(43) + (52)(54) + (52)(63)}{48 + 43 + 52 + 63}$

$$\bar{x} = \frac{10816}{208} = \boxed{52.5}$$

(P-b)

For Fish:

$$\bar{x} = \frac{[(28.5)(19) + (26.5)(21) + (28.5)(29) + (28.5)(46)]}{19 + 21 + 28 + 46}$$

$$x = \frac{3249}{114}$$

$$x = \boxed{28.5}$$

Rice:

$$\bar{x} = \frac{[(263.5)(315) + (263.5)(276) + (263.5)(243) + (263.5)(220) + (763.5)(720)]}{315 + 276 + 243 + 220}$$

$$x = \frac{271168}{1054} = \boxed{257.2}$$

Q1(B)

For Men and Women the Milk, Root vegetable and wheat flour are very low for both these in Q4 and Q3 it increases high in Q2 and Q1 such that when they eat more vegetables etc. consume much milk, root vegetable

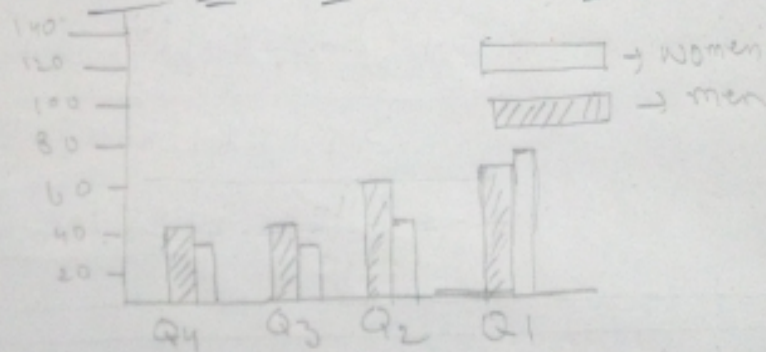
(P. 7)

and wheat flour than those who eat less fresh vegetables.

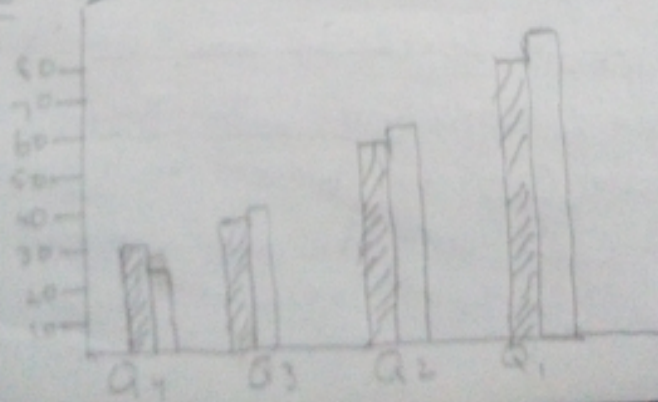
(C) value of men in rice decreasing from Q_4 to Q_1 but in fruit and fish mean value of rice from Q_4 to Q_1 in men and women.

(D) Diagram:

Men and women for fish



For fruit



(P. 8)

(E): According to the Above information in the given table we can say that men need more food to maintain their energy level than women.

(F): Standard deviation

$$S = \sqrt{n}$$

According to the formula

⇒ The value of the standard deviation of men is more than in fresh vegetables, fruits, flour, total grains and meat. The value of standard deviation is same for both (men and women) for remaining categories.

(P-9)

Q2(A)

Consu: The process of collecting and recording information about the number given population.

=> Its purpose is to ~~count~~ count the entire population objects in given observation.

=> It tell us ~~where are~~ and help the Govt to divide how to distribute funds and assistance.

(B): Difference B/w Consu and Sample Survey: in collection of Govt Data.

Sample Survey:

Both the Method Consu and Sample Survey are used for the collection of data for Govt.

=> A sample survey refers to

(P-10)

a Population from which information. The process of sampling is to reduce the cost of the work that would take to survey the entire target population.

Census :-

A Survey that measure the entire targeted population and collect data or information is called census.

⇒ It tell us that who are and where we are going as a nation.

⇒ It help in ~~Government~~ Govt in the distribution of funds for different purpose.

(C)

From the given information 2011 ~~UK census~~ UK census attracted response rate of about 94% which is good but it can rise any kind of error until

(P-11)

until situation is complete
It can be cause error or
any be rise of error
many more.

D): In the census about asking
on specific group or religion may
cause of bad behavior or
and misdeed misunderstanding.
⇒ If it possible that
some one not answer like
that kind of questions.

E): There are a lot of potential
problems in conducting the 2011 UK
census issue.

⇒ Availability of online connectio
means net to every person
is not possible.

⇒ Behaviour of person.

⇒ The problem might be
overcom if the provide

(P-12)

internet connection over all the country to each person and make sure and punctually to every person give its desired response.

F)

⇒ study of every object under the observation it is so difficult and complicated to Govt agency to collect the data and information to from every and each single person because there are a lot of things that have been done by these agency not only for the completion of census.

(P-13)

Q 3(A)

Find Rainfall 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

Arithmetic Mean

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

Class	f	x	fx
20-24	1	22	22
25-29	3	27	81
30-34	5	32	160
35-39	8	37	296
40-44	5	42	210
45-49	2	47	94
50-54	0	52	0
55-59	1	57	57
		420	2000

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

$$= \frac{920}{25}$$

$$= 36.8$$

$$= \boxed{36.8}$$

Geometric mean :

	f	x	log x
20-24	1	22	1.34
25-29	3	27	1.43
30-34	5	32	1.50
35-39	8	37	1.56
40-44	5	42	1.62
45-49	2	47	1.67
50-54	0	52	1.71
55-59	1	57	1.75
			12.58

$$G.M = \text{Ant log} \left(\frac{\sum f \log x}{\sum f} \right)$$

$$\text{Log} = \left(\frac{12.58}{25} \right) = 0.5032$$

$$\text{Antilog} = \boxed{3.1856}$$

Harmonic Mean

Harmoni c Mean

	f	x	f/x
20-24	1	22	0.45
25-29	3	27	0.11
30-34	5	32	0.15
35-39	8	37	0.21
40-44	5	42	0.11
45-49	2	47	0.04
50-54	0	52	0.01
55-59	1	57	0.01
			0.76

$$H.M = \frac{25}{0.76}$$

$$= \boxed{32.89}$$

Median:

	f	C.B	C.F
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

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

$$l = \frac{n}{2} = \frac{25}{2}$$

$$= 12.5$$

It lies in Group 35-39

$$\text{Median} = 34.5 + \frac{4}{8} (12.5 - 9)$$

$$= 34.5 + 14/8$$

$$= 276 + 14$$

$$= 290$$

$$\text{Median} = \boxed{36.25}$$

Mode:

20-24	1
25-29	3
30-34	5
35-39	8
40-44	5
45-49	2
50-54	0
55-59	1

$$\text{Mode} = L + \frac{f_m - f_0}{2f_m - f_0 - f_1} \times h$$

$$= 35 + \frac{(8-5)}{2(8)-5-5} \times 4$$

$$= 35 + \left(\frac{3}{6} \times 4 \right)$$

$$= 35 + 2$$

$$= \boxed{37}$$

(P-16)

Quartiles :-

Q1

$$Q_1 = L + h/f \left(\frac{x}{4} - c \right)$$

$$x/4 = \frac{\Sigma f}{4} = \frac{25}{4} = 6.25$$

$$= 29.5 + 5/5 (6.25 - 4)$$

$$Q_1 = \boxed{32.75}$$

Q2

$$Q_2 = L + h/b \left(\frac{x}{4} - c \right)$$

$$x/4 = \frac{\Sigma f}{4} = \frac{25}{4} = 6.25$$

$$Q_2 = 34.5 + 5/5 (6.25 - 9)$$

$$Q_2 = \boxed{37.687}$$

Q3

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

$$Q_3 = 39.5 + 5/5 (18.75 - 17)$$

$$Q_3 = \boxed{41.25}$$

$$(P = 17)$$

Decile:

$$D_m = l + h/f \left(\frac{m \cdot n}{10} - c \right)$$

from table $D = l + h/f \left(\frac{8 \cdot n}{10} - c \right)$

$$D_8 = 34.5 + 5/5 (20 - 17)$$

$$D_8 = \boxed{42.5}$$

Percentile:

$$P_m = l + h/f \left(\frac{m \cdot n}{100} - c \right)$$

$$\frac{45 \cdot n}{100} = \frac{42(25)}{100} = 11.25$$

From table

$$P = 34.5 + 5/8 (11.25 - 7)$$

$$P = \boxed{35.906}$$

Range:

	f	C.B
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	6	49.5 - 54.5
55-59	4	54.5 - 59.5

Range = largest value - smallest value

$$= 59.5 - 19.5$$

$$\text{Range} = \boxed{40}$$

(P-18)

Mean deviation

	f	x	$f \cdot x$
20-24	1	22	14.8
25-29	3	27	29.4
30-34	5	32	24
35-39	8	37	10.6
40-44	5	42	26
45-49	2	47	20.4
50-54	0	52	0
55-59	1	57	2.2
			136.2

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

$$n = 36$$

$$M.D = \frac{136.2}{36}$$

$$= \boxed{3.78}$$

Variance:

	f	x	$f \cdot x$
20-24	1	22	-14.8
25-29	3	27	-9.6
30-34	5	32	-4.2
35-39	8	37	0.2
40-44	5	42	5.2
45-49	2	47	10.2
50-54	0	52	15.2
55-59	1	57	20.2
			21.6

$$= \frac{\sum f (x - \bar{x})^2}{\sum f}$$

$$= \frac{21.6}{36}$$

$$= \boxed{0.6}$$

(P-19)

Standard deviation :-

<u>X</u>	<u>f</u>	<u>fx</u>	<u>x - \bar{x}</u>
20-24	1	22	-14.8
25	3	75	-9.8
30	5	150	-4.8
35	8	280	0.2
40	5	210	5.2
45	2	90	10.2
50	0	0	15.2
55	1	55	20.2
	<u>920</u>	<u>21.6</u>	

$$S = \sqrt{\frac{\sum f(x-x)^2}{\sum f}}$$

$$S = \sqrt{\frac{25(21.6)}{25}}$$

$$S = \sqrt{\frac{540}{25}} = \sqrt{21.6}$$

$$S = \boxed{4.64}$$

Coefficient of variation

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

$$C.V = \frac{7.413}{36.8}$$

$$\text{So coefficient of variation} = \boxed{0.2014}$$

Skewness :-

$$= \frac{\text{Mean} - \text{mode}}{\text{standard deviation}}$$

$$= \frac{36.8 - 37}{7.413}$$

$$= \frac{-0.2}{7.413}$$

$$= -0.026$$

$$\text{Skewness} = \boxed{-0.026}$$

(P-20)

Q No:3 (B)

Arithmetic Mean:

Arithmetic Mean $x = 1, 3, 5, 8, 5, 2, 0, 1$

$0, 1, 1, 2, 3, 5, 5, 8$

$$0 + 1 + 1 + 2 + 3 + 5 + 5 + 8$$

$$\bar{x} = \frac{25}{8} = 3.125$$

↳ Geometric and Harmonic mean

= Antilog $(1/x \sum \log n)$

$$\bar{x} = \frac{25}{8} = 3.125$$

$x = 1, 3, 5, 8, 5, 2, 0, 1$

$$H.M = \frac{\sum n}{\sum n/H}$$

It is not solving there is zero in Data.

(P-21)

Median:

$$\bar{x} = \frac{(n+1)^{th}}{2}$$
$$= \frac{(8+1)^{th}}{2} = \boxed{4.5^{th}}$$

$$\bar{x} = 4^{th} + 0.5(5^{th} - 4^{th})$$

0, 1, 1, 2, 3, 5, 5, 8

$$\bar{x} = 2 + 0.5 = \boxed{2.5}$$

Mode:

1, 3, 5, 8, 5, 2, 0, 1

$$x = \boxed{1, 5}$$

Quartiles:

$$Q_1 \left(\frac{x}{4} + 1 \right)^{th}$$

$$= \left(\frac{25}{4} + 1 \right)^{th}$$

$$= \boxed{7.25}$$

$$Q_2 \left(\frac{x}{4} + 1 \right)^{th} = \left(\frac{2+25}{4} + 1 \right) \quad \frac{50+1}{4} = \frac{51}{4}$$

$$= \boxed{12.75}$$

$$Q_3 \left(\frac{x}{4} + 1 \right)^{th}$$

$$\left(\frac{3 \times 25}{4} + 1 \right)^{th}$$

$$\frac{75+1}{4} = \frac{76}{4} = 19$$

$$= \boxed{19}$$

(P-22)

$$\begin{aligned} Q_4 &= \left(\frac{n}{4} + 1\right)^{\pi} \\ &= \left(\frac{4 \times 25}{4} + 1\right)^{\pi} \left(\frac{100}{4} + 1\right)^{\pi} \\ &= \boxed{25 \cdot 25} \end{aligned}$$

Derive :

$$\begin{aligned} D_1 &= \left(\frac{n}{10} + 1\right)^{\pi} \\ &= \left(\frac{25}{10} + 1\right)^{\pi} \left(\frac{26}{10}\right) = \boxed{2.6} \end{aligned}$$

$$\begin{aligned} D_2 &= \left(\frac{n}{10} + 1\right)^{\pi} \\ &= \left(\frac{2 \times 25 + 1}{10}\right)^{\pi} \\ &= \left(\frac{50 + 1}{10}\right)^{\pi} = \left(\frac{51}{10}\right)^{\pi} = \boxed{5.1} \end{aligned}$$

$$\begin{aligned} D_3 &= \left(\frac{n}{10} + 1\right)^{\pi} \\ &= \left(\frac{3 \times 25 + 1}{10}\right)^{\pi} = \left(\frac{76}{10}\right)^{\pi} = \boxed{7.6} \end{aligned}$$

$$\begin{aligned} D_4 &= 4 \left(\frac{n}{10} + 1\right)^{\pi} = \frac{1 + 0.6(2-1)}{10} \left(\frac{8+10}{10}\right)^{\pi} \\ &= \left[4 \left(\frac{8+10}{10}\right)\right]^{\pi} = D_4 = 1.6 \\ &= 3.6^{\pi} \end{aligned}$$

(P-23)

Percentile:

$$= m \left(\frac{n+1}{100} \right)^{\text{th}}$$

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

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

$$P_1 = \boxed{1.25}$$

$$P_2 = \left(\frac{n}{100} + 1 \right) = \left(\frac{2 \times 25}{100} + 1 \right) = \left(\frac{50}{100} + 1 \right)^{\text{th}}$$

$$\frac{51}{100} = \boxed{0.51}$$

P_3

$$\left(\frac{n}{100} + 1 \right)^{\text{th}} = \left(\frac{3 \times 25}{100} + 1 \right)^{\text{th}} = \frac{75}{100} + 1 = \frac{76}{100}$$

$$= \boxed{0.76}$$

P_4

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

$$\left(\frac{4 \times 25}{100} + 1 \right)^{\text{th}} = \left(\frac{100}{100} + 1 \right)^{\text{th}}$$

$$= \frac{101}{100} = \left(\frac{101}{100} \right)^{\text{th}}$$

$$= \boxed{1.01}$$

Range:

Range = Maximum - Minimum

= 8 - 0

Range = 8

Mean deviation:

= $\sum \left(\frac{x - \bar{x}}{n} \right)$ $\bar{x} = 3.125$

x	x - \bar{x}
1	2.125
3	0.125
5	1.875
8	4.875
5	1.875
2	1.125
0	3.125
1	2.125
	17.25

M.D = $\frac{17.25}{8}$

Mean deviation = 2.156

Quartile deviation:

= $Q_3 - Q_1$

= $\frac{5 - 1}{2} = \frac{4}{2}$

= 2

$$(P=25)$$

Variance

x	x^2
1	1
3	9
5	25
8	64
5	25
2	4
0	0
$1/17$	$1/17$

$$S^2 = \frac{129}{8} = \frac{(25)^2}{8}$$

$$S^2 = 16.125 - 1.766$$

$$S^2 = \boxed{16.359}$$

Standard deviation

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

$$S = \sqrt{\frac{129}{8} - \left(\frac{25}{8}\right)^2}$$

$$S = \sqrt{16.359} \Rightarrow S = \boxed{2.521}$$

Skewness:

$$= 3 \left(\frac{\text{mean} - \text{median}}{s} \right)$$

$$= 3 \left(\frac{3.125 - 2.5}{2.521} \right) = \boxed{0.745}$$

The End