

Name:

SHAHAB

ID :

13790

Q. No. 1

ANS:- (a) For men overall mean consumption of fresh vegetable.

$$\text{mean} = \frac{204 + 259 + 266 + 217}{4}$$

$$= 236.5$$

⇒ Mean of fruits:-

$$\text{mean} = \frac{31 + 45 + 69 + 105}{4} = 62.5$$

⇒ Mean of Rice:-

$$\bar{x} = \frac{(367 + 337 + 269 + 246)}{4}$$
$$= 304.75$$

⇒ Mean of Fish:-

$$\bar{x} = \frac{23 + 28 + 31 + 44}{4}$$
$$= 31.5$$

⇒ For women:-

mean of fresh vegetable

$$\bar{x} = \frac{178 + 235 + 266 + 304}{4} = 245.75$$

⇒ Mean of Fruits:-

$$\bar{x} = \frac{28 + 46 + 70 + 121}{4} = 66.25$$

⇒ Mean of Rice:-

$$\bar{x} = \frac{315 + 276 + 243 + 220}{4} = 263.5$$

⇒ Mean of meat

$$\bar{x} = \frac{48 + 43 + 54 + 63}{4} = 52$$

⇒ Mean of fish:-

$$\bar{x} = \frac{19 + 21 + 28 + 46}{4} = 28.5$$

Combined mean

Combined mean for men

C.M of fresh vegetable

$$\bar{x}_{\text{Comb}} = \frac{\bar{x}_1 n_1 + \bar{x}_2 n_2 + \dots + \bar{x}_n n_n}{n_1 + n_2 + \dots + n_n}$$

$$= \frac{(236.5)(204) + (236.5)(259) + (236.5)(266) + (236.5)(217)}{204 + 259 + 266 + 217} = 236.5$$

Combined mean of Rice:-

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

Combined mean of fish:-

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

C. mean of meat:-

$$x_c = \frac{(69.25)(70) + (69.25)(61) + (69.25)(69) + (69.25)(70)}{70 + 61 + 69 + 70} = \boxed{69.25}$$

Combined mean of women:-

$$\bar{x}_c = \frac{(1245.15)(178) + (245.75)(235) + (245.75)(266) + (245.75)(304)}{178 + 235 + 266 + 304} = \boxed{x_c 245.75}$$

Com. mean of meat:-

$$x_c = \frac{(52)(48) + (52)(43) + (52)(54) + (52)(63)}{48 + 43 + 54 + 63} = \boxed{x_c = 52}$$

Com. mean of fish:-

$$x_c = \frac{28.5(19) + (28.5)(21) + (28.5)(28) + (28.5)(46)}{19 + 21 + 28 + 46} = \boxed{28.5}$$

Com mean of Rice

$$x_c = \frac{(263.5)(315) + (263.5)(276) + (263.5)(243) + (263.5)(220)}{263.5 + 263.5 + 263.5 + 263.5} = \boxed{263.5}$$

3

Q No 1 (b)

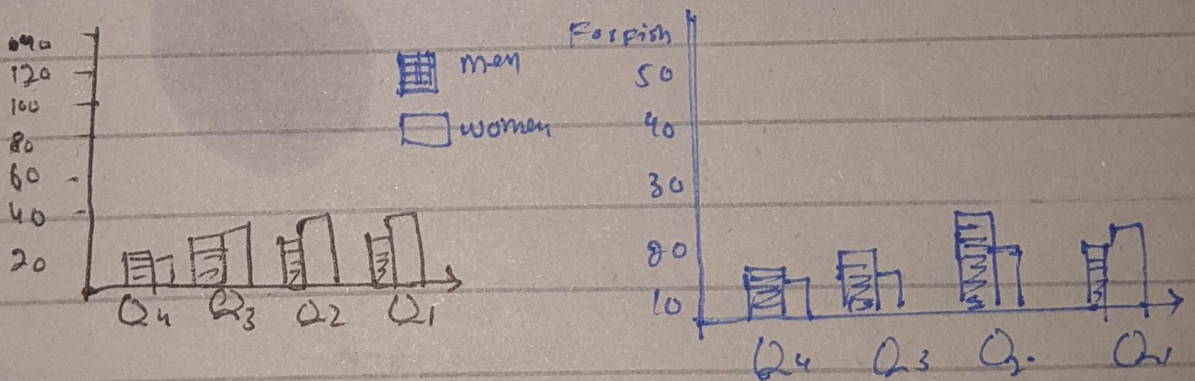
ANS = Milk, root, vegetable and wheat flour are very low for both men and women in Q4 and Q3 but it rises high in Q2 and Q1 so those who eat most vegetable consume much more milk root vegetable and white flour than those who eat less fresh vegetable.

Part

Part (c) ANS =

in fruit and fish the value of mean increasing from Q4 to Q1 in men and women. But in rice the value of mean decreasing from Q4 to Q3.

Part (d) Draw a suitable diagram for fruit.



Part (F)

Standard deviation = $S.E \times \sqrt{n}$ By using above

Formula the value of standard deviation of men is more than women wheat flour vegetables fruit, wheat flour, whole grain.

Q2 No 2

(page 1)

~~Ans~~ (part A) The purpose of census is to count the entire population of a country and individuals at location where they actually live. census counts the number of living in the home, their age, sex and race for it keep in the home the age forming and important base for planning policy development and decreasing numbering.

(part B) in census each and every unit of the population is study is the sampling. The census refer to periodic collection of inform about the population from the suitable to use census method if the population compare to sample survey. census survey take more time however it's margin for error in sample survey while census survey is more correct.

~~part B~~ (part d) Ironic response to the census by the public signify there into word attitude to the survey and their carelessness in following accurate data question of these types are invalid data with such abuse response.

2 NO3

Rain Fall	f	no of years	no of plants	$f \cdot x$	f/x	$\log f/x$	$f \log(x)$	$\bar{x} \cdot \bar{x}$	$\Sigma x - x^2$	$(\Sigma x - \bar{x})^2$
20-40	1	22	22	0.046	1.34	1.34	-11.8	219.04	219.04	
25-29	3	27	81	0.12	1.43	4.29	-9.8	96.04	288.12	
30-34	5	32	160	0.15	1.50	7.5	9.8	23.04	115.2	
35-39	8	37	296	0.21	1.56	12.48	0.2	0.04	0.32	
40-44	5	42	210	0.11	1.62	8.1	5.2	27.04	135.2	
45-49	2	47	94	0.04	1.67	3.34	10.2	104.04	208.04	
50-54	0	52	0	0	1.71	0	15.2	231.04	0	
55-59	1	57	57	0.07	1.75	17.5	20.2	408.04	408.04	
Total	25		920	0.693	38.8					1373.96

Rain Fall	f	no. of years	$f(x - \bar{x})$	Class Interval	Cumulative Frequency
20-24	1		14.8	19.25-24.5	1
25-29	3		29.4	24.5-29.5	4
30-34	5		24	29.5-34.5	9
35-39	8		1.6	34.5-39.5	17
40-44	5		26	39.5-44.5	22
45-49	2		20.4	44.5-49.5	24
50-54	0		0	49.5-54.5	24
55-59	1		20.2	54.5-59.5	25

1) A.M = $\frac{\sum_{i=1}^n f_i x_i}{\sum_{i=1}^n f_i} = \frac{920}{25} = A.M = 36.80$

2) H.M = $\frac{\sum_{i=1}^n f_i}{\sum_{i=1}^n \left[\frac{f_i}{x_i} \right]} = \frac{25}{0.693} = H.M = 36.08$

3) G.M = $\text{Anti-log} \left[\frac{\sum_{i=1}^n f_i \log(x_i)}{\sum_{i=1}^n f_i} \right]$

Anti log $\left[\frac{38.8}{25} \right]$

Anti-log (1.55)

G.M = 35.48

$$\text{median} = \left(\frac{n}{2}\right)^{\text{th}} = \left(\frac{25}{2}\right)^{\text{th}} \\ = (12.5)^{\text{th}} \text{ with - is ties blw in the .}$$

Class = 34.5 - 39.5 - therefore

$$\text{median} = l + \frac{h}{f} \left(\frac{n}{2} - cf\right) \\ = 34.5 + \frac{5}{8} (12.5 - 9) \\ = 34.5 + \frac{5}{8} = (3.50) \\ = 34.5 + 2.19$$

$$\text{So } \boxed{\text{median} = 36.69}$$

⑤ Range = Height class upper boundaries

Range = lowest class lower boundaries.

$$59.5 - 19.5$$

$$\text{Range} = 40$$

5]

$$\text{⑥ mode} = l + \frac{f_m - f_1}{(f_m - f_1) + (f_m - f_2)} \times h$$

l - lower class boundaries of the modal class

f_m = Frequency of the modal class

f_1 Frequency associated with the class following the modal class -

h = width of class interval.

So = the mode can be.

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

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

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

⑦ Quartiles: The three values which divide the distribution into four equal parts are called the Quartiles.

These values are denoted by Q_1 , Q_2 and Q_3 . Q_1 is called the lower quartile and Q_3 are called upper quartile Q_2 is called median.

So we shall calculate Q_1 and Q_3

$$Q_1 = \left(\frac{n}{4}\right)^{\text{th}}$$

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

$= (6.25)^{\text{th}}$, which associated in the class (29.5 - 34.5) therefore

$$\begin{aligned}
 Q_1 &= l + \frac{h}{f} \left(\frac{n}{4} - c.f \right) \\
 &= 29.5 + \frac{5}{5} (6.25 - 4) \\
 &= 29.5 + 2.25 \\
 Q_1 &= 31.75
 \end{aligned}$$

$$\begin{aligned}
 Q_3 &= \left(\frac{3n}{4} \right)^{th} \\
 &= \left(\frac{3 \times 25}{4} \right)^{th}
 \end{aligned}$$

$= (18.75)^{th}$ which corresponds in the class

(39.5-44.5) therefore.

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

$$= 39.5 + \frac{5}{5} (18.75 - 17)$$

~~$$= 39.5 + \frac{5}{5} (1)$$~~

$$39.5 + 1.75 = Q_3 = 41.25$$

8

(page 8)

Deciles: which divide the distribution into ten equal parts, are called deciles.

which is denoted by D_1, D_2, \dots, D_9

The calculation of each decile to be calculated is too large and time consuming.

So for the practice, we can calculate D_2

$$D_2 = \left(\frac{2n}{10} \right)^{\text{th}}$$

$$= \left(\frac{2 \times 25}{10} \right)^{\text{th}}$$

$= 5^{\text{th}}$, which corresponds in the class (29.5 - 34.5)

there for

$$D_2 = l + \frac{h}{f} \left(\frac{2n}{10} - C.f \right)$$

$$= 29.5 + \frac{5}{5} (5 - 4)$$

$$= 29.5 + 1$$

$$D_2 = 30.5$$

(9)

Page (9)

percentile: which is divided the distribution into hundred equal parts are called percentiles, which is denoted by P_1, P_2, \dots, P_{99}

$$\begin{aligned} \text{Ans } P_{30} &= \left(\frac{30n}{100} \right)^{\text{th}} \\ &= \left(\frac{30 \times 25}{100} \right)^{\text{th}} \end{aligned}$$

$= (7.5)^{\text{th}}$ which associated

in the class $(29.5 - 34.5)$ So

$$P_{30} = l + \frac{h}{7} \left(\frac{30n}{100} - C.F \right)$$

$$= 29 + \frac{5}{5} (7.5 - 4)$$

$$= 29.5 + 3.50$$

$$\boxed{P_{30} = 33}$$

(10)

$$m.o = \frac{\sum_{i=1}^n f_i |x - \bar{x}|}{\sum_{i=1}^n f_i}$$

$$= \frac{136.4}{25}$$

$$m.o = 5.46$$

(11) variance

$$\frac{\sum_{i=1}^n f_i (x - \bar{x})^2}{\sum_{i=1}^n f_i}$$

$$= \frac{1373.96}{25}$$

$$\boxed{\text{variance} = 54.96}$$

(12) standard deviation = $\sqrt{\text{variance}}$

$$= \sqrt{54.96}$$

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

(13)

Coefficient of Variation

$$(C.V) =$$

$$\frac{S.D \times 100}{\bar{n}}$$

$$= \frac{7.41}{36.80} \times 100$$

$$C.V = 20.14$$

(14)

Quartile Deviation (Q.D) = $\frac{Q_3 - Q_1}{2}$

where $Q_3 = 41.25$ and $Q_1 = 31.75$

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

$$Q.D = 4.75$$

(15)

Skewness (Sk) = $\frac{\text{mean} - \text{mode}}{S.D}$

where, mean = 36.80, mode = 37
and S.D = 7.41

$$Sk = \frac{36.80 - 37}{7.41}$$

$$= \frac{-0.20}{7.41}$$

$$\text{Skewness} = -0.03$$

n	$1/n$	$\log(x)$	$Cn - \bar{n}$	$(n - \bar{n})^2$	$ x - \bar{n} $
22	0.045	1.34	-14.8	219.04	14.8
27	0.037	1.4313	-9.8	96.04	9.8
27	0.037	1.4313	-9.8	96.04	9.8
27	0.037	1.4313	-9.8	96.04	9.8
32	0.0312	1.5051	-4.8	23.04	4.8
32	0.0312	1.5051	-4.8	23.04	4.8
32	0.0312	1.5051	-4.8	23.04	4.8
32	0.0312	1.5051	-4.8	23.04	4.8
32	0.0312	1.5051	-4.8	23.04	4.8
32	0.0312	1.5051	-4.8	0.04	0.2
37	0.027	1.5682	0.2	0.04	0.2
37	0.027	1.5682	0.2	0.04	0.2
37	0.027	1.5682	0.2	0.04	0.2
37	0.027	1.5682	0.2	0.04	0.2
37	0.027	1.5682	0.2	0.04	0.2
37	0.027	1.5682	0.2	0.04	0.2
37	0.027	1.5682	0.2	0.04	0.2
37	0.027	1.5682	0.2	0.04	0.2
37	0.027	1.5682	0.2	27.04	5.2
37	0.027	1.5682	0.2	27.04	5.2
42	0.0238	1.6232	5.2	27.04	5.2
42	0.0238	1.6232	5.2	27.04	1.76
42	0.0238	1.6232	5.2	27.04	1.76
42	0.0238	1.6220	5.2	3.10	
42	0.0238	1.6720	5.2	3.10	
47	0.0212	1.6720	1.76	908.04	20.02
47	0.0212	1.7588	2.02		
57	0.0175				
total	0.73	38.92		1172.12	136.40

① $A.M = \frac{\sum_{i=1}^n x_i}{n} = \frac{920}{25} = A.M = 36.8$

② $H.M = \frac{n}{\sum_{i=1}^n (1/x_i)} = 25 / 0.73$
 $H.M = 34.25$

③ $G.M = \text{Anti-log} \left[\frac{\sum_{i=1}^n \log(x_i)}{n} \right]$
 $\text{Anti-log} \left[\frac{38.92}{25} \right] = \text{Anti-log } 1.56$
 $G.M = 36.04$

4-mode: most repeated value is called mode.
 81 (mode = 37)

⇒ ⑤ median: is the mid-value of a data set
 median $\left[\left(\frac{n}{2} + 1 \right) \text{th} \right] = \left(\frac{25}{2} + 1 \right) \text{th} = (12.5 + 1) \text{th}$

median = 13th integer of a data set. median 37

⑥ Quartiles:

$Q_1 \left[\left(\frac{n}{4} + 1 \right) \text{th} \right] = \left(\frac{25}{4} + 1 \right) \text{th}$
 $(6.25 + 1) \text{th} \quad (7.25) \text{th} = 7 \text{th} = Q_1 = 32$

$Q_3 = \left[\left(\frac{3n}{4} + 1 \right) \text{th} \right]$
 $\left[\left(\frac{3 \times 25}{4} + 1 \right) \text{th} \right] = (19.75) \text{th} = (20) \text{th}$, integer

$Q_3 = 43$

⑦ Deciles: As $D_2 \left[\left(\frac{2n}{10} + 1 \right) \text{th} \right] = \left(\frac{2 \times 25}{10} + 1 \right) \text{th}$
 $(5 + 1) \text{th} = 6 \text{th}$ integer $= D_2 = 32$

⑧ Percentiles: As $P_{30} \left[\left(\frac{30n}{100} + 1 \right) \text{th} \right]$
 $\left[\left(\frac{30 \times 25}{100} + 1 \right) \text{th} \right] = (7.5 + 1) \text{th} = (8.5) \text{th}$

$P_{30} = 9 \text{th}$ integer $= P_{30} = 32$

⑨ Range - largest value = small value
 $R = 57 - 22 = R = 35$

10 $Q.D = \frac{Q_3 - Q_1}{2} = \frac{43 - 32}{2} = Q.D = 5$

11 Skewness = mean - mod =
 $\frac{36.8 - 37}{7.41} = 0.20$ Skewness = 0.03

12 Coefficient of variation (C.V) $\frac{S.D \times 100}{\bar{x}}$
 $\frac{7.41 \times 100}{36.8} = C.V = 20.14$

(page 17)

(13) mean deviation = $\sum_{i=1}^n \frac{|x - \bar{x}|}{n}$

$$= \frac{136.40}{25}$$

$$m.d = 5.46$$

(14) variance = $\sum_{i=1}^n \frac{(n_i - \bar{n})^2}{n}$

$$= \frac{1172.12}{25}$$

$$\text{variance} = 46.88$$

(15) S.D = $\sqrt{\text{variance}}$

$$= \sqrt{46.88}$$

$$\boxed{S.D = 6.85}$$