

TNU Peshawar

Online Paper

Bid state

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Ans No ①

Ans: (a) - For Men
over all mean consumption
of fresh vegetable.

$$\text{mean} = \frac{204 + 256 + 266 + 217}{4}$$

$$= 236.5$$

→ 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 vegetables

$$\bar{X} = \frac{178 + 235 + 266 + 364}{4} = 259.75$$

Ans D

Mean of Fruits:-

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

$$= \boxed{66.25}$$

Mean of Rice:-

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

$$= \boxed{263.5}$$

Mean of Meat:-

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

$$= \boxed{52}$$

Mean of fish:-

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

$$= \boxed{28.5}$$

Ans No (I)

Part (B) Question No 1:

Ans:

Milk, root vegetable and wheat flour are very low for both men and women.

In egg and veg but its rises high in egg and veg so those who eat most vegetables and wheat flour than those who eat less fresh vegetables.

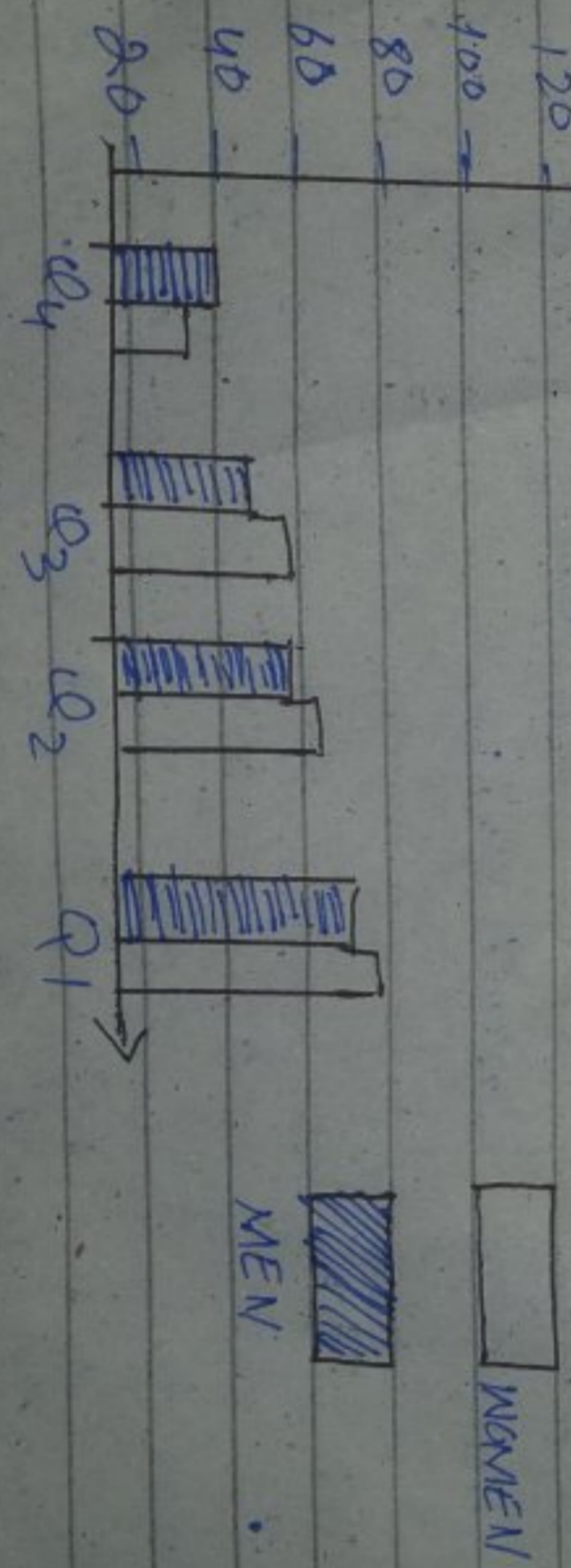
Part No (C)

Ans:

In fruits and fish the value of mean increasing Q_4 to Q_1 in men and women. But rise the value of mean decreasing from Q_4 to Q_3 .

Part No D:

A suitable diagram of fruits.



Ans ①

Com. Mean of Rice:

$$X_c = \frac{(263.5)(315) + (263.5)(226) + (263.5)(243) + (263.5)(220)}{}$$

$$X_c = \underline{263.5}$$

Ans ①

C. Mean of Meat

$$\bar{X}_c = \frac{(69.25)(70) + (69.25)(62) + (69.25)(69) + (69.25)(70)}{70 + 61 + 69 + 70}$$

$$\bar{X}_c = \boxed{69.25}$$

Combined Mean of Wages

$$\bar{X}_c = \frac{(245.75)(178) + (245.75)(35) + (245.75)(266) + (245.75)(304)}{178 + 235 + 266 + 304}$$
$$\bar{X}_c = \boxed{245.75}$$

Combined Mean of Meat

$$\bar{X}_c = \frac{(52)(48) + (52)(54) + (52)(64) + (52)(63)}{48 + 43 + 54 + 63}$$

$$\bar{X}_c = \boxed{52}$$

Com. Mean of Fish

$$\bar{X}_c = \frac{(28.5)(19) + (28.5)(21) + (28.5)(33) + (28.5)(46)}{19 + 21 + 28 + 46}$$

$$\bar{X}_c = \boxed{28.5}$$

Combined Mean

Combined For Men

C. MoF Fresh vegetables

$$\bar{X}_{\text{comb}} = \frac{\bar{X}_{n1} + \bar{X}_{n2} + \bar{X}_{n3}}{n_1 + n_2 + n_3}$$

$$= \frac{[(236.5)(204) + (236.5)(259) + (266)(236.5)(47)]}{204 + 259 + 266 + 217}$$

$$= \boxed{236}$$

Combined Mean of Rice:

$$\bar{X}_c = (367)(304.75) + (337)(304.75) + (269)(304.75) + (246)(304.75)$$

$$= \boxed{371.25}$$

Combined Mean of Fish:

$$\bar{X}_c = (23)(31.5) + (31.5)(28) + (31)(31)$$

Part No (E)

Standard deviation = $S.E \times \sqrt{N}$

By using above formula the value of men is more than women wheat plus vegetables, fruit, wheat plus whole grain.

ANS NO (2)

QNO 2!

Ans of Part (A)

The purpose of census is to count the entire population of a country and individuals at location where the actually lives. Census count the number of living in the home, their age, sex and race. It helps in the farming and important base for planning policy development and decreasing numbering.

Part No. (B)

In census each and every unit of the population is studied in the sampling. The census refer to periodic collection information about the population from the its more suitable to use census method, if the population compare to sample survey.

Ans (2)

Census survey take more time
however it is margin for error
in sample survey while census is
more correct.

Part No (C.)

Obviously not having a full
response rate to the census
as insufficient data will be
collected to know about population
and of following base for planning
and policy development.

Part No (E)

By using the information of
given table it is true
that mean needs more food
to maintain its energy level.

Part No (F)

Census, they mean the study
of every object under the observation
and in real it is such a
difficult task to perform.

Also it is quite difficult to
government go to every single person
and collect the whole a lot of
things that have been done by

Ans 2

These agencies not only do
an error may increase error
further.

Question No: 3

Rainfall	No of Year	(f)	x mid-pt ants	Fx	f/x	log(x)	F log(x)	x - \bar{x}	(x - \bar{x}) ²	f(x - \bar{x}) ²
20-24	1	22	22	0.046	1.34	1.34	-14.8	219.04	219.04	
25-29	3	27	81	0.12	1.43	4.29	-9.8	96.04	283.12	
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	0.017	1.75	1.75	20.2	408.04	408.04	
Total	25		920	0.693	38.8				1373.96	

Ans No 3

ANS (3)

Rainfall	(f) No. of Years	$f(\Sigma x - \Sigma x^2)$	(C-1) Class Boundary	(C.F) Cumulative Frequency
20-24	1	14.8	19.5-24.5	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

Ans ③

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

$$\text{A.M} = 36.80$$

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

$$\text{H.M} = 36.08$$

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

$$= \text{Antilog} \left[\frac{38.8}{25} \right]$$

$$= \text{Antilog} (1.55)$$

$$\text{G.M} = 35.48$$

Ans (3)

$$\begin{aligned} \text{Median} &= \left(\frac{n}{2}\right)^{\text{th}} \\ &= \left(\frac{25}{2}\right)^{\text{th}} \\ &= (12.5)^{\text{th}}, \text{ which is less than in the} \\ &\text{ class } 34.5 - 39.5 \text{ therefore} \end{aligned}$$

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

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

$$= 34.5 + \frac{5}{8} (3.5)$$

$$= 34.5 + 2.19$$

∴

$$\text{Median} = 36.69$$

Range = Height class upper boundaries.

Range = Lowest class lower boundaries.

$$\text{Range} = 59.5 - 19.5$$

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

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

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 the class interval

So the mode, can be

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

Ans (3)

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

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

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

(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 quartiles, Q_2 is called median.

∴ we shall calculate Q_1 and Q_3

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

$$Q_1 = \left(\frac{25}{4}\right)^{\text{th}}$$

$Q_1 = (6.25)^{\text{th}}$, which associated in the class (29.5 - 34.5)

Therefore

$$Q_1 = l + \frac{h}{f} \left(\frac{n}{4} - c.f\right)$$

Ans (3)

$$Q_1 = 29.5 + \frac{5}{5} (6.25 - 4)$$

$$Q_1 = 29.5 + 2.25$$

$$Q_1 = 31.75.$$

$$Q_3 = \left(\frac{3n}{4} \right)^{\text{th}}$$

$$Q_3 = \left(\frac{3 \times 25}{4} \right)^{\text{th}}$$

$Q_3 = (18.75)^{\text{th}}$ which corresponds in the class, (39.5 - 41.5), therefore.

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

$$Q_3 = 39.5 + \frac{5}{5} (18.75 - 17)$$

$$Q_3 = 39.5 + 1.75$$

$$Q_3 = 41.25.$$

ANS (3)

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 paractic, we can calculate D_2 ?

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

$$D_2 = \left(\frac{2 \times 25}{10}\right)^{th}$$

$D_2 = 5^{th}$, which corresponds in the class (29.5 - 34.5)

there fore

$$D_2 = l + \frac{h}{8} \left(\frac{2n}{10} - 4\right)$$

$$D_2 = 29.5 + \frac{5}{5} (5 - 4)$$

$$D_2 = 29.5 + 1$$

$$D_2 = 30.5$$

Ans ③

(9) Percentile :-

Percentile which is divide the distribution into hundred equal parts are called percentile, which is denoted by.

$$P_1, P_2, \dots, P_{99}$$

$$\text{As } P_{30} = \left(\frac{30n}{100}\right)^{\text{th}}$$

$$P_{30} = \left(\frac{30 \times 25}{100}\right)^{\text{th}}$$

$P_{30} = (7.5)^{\text{th}}$, which associated in the class (29.5 - 34.5).

So

$$P_{30} = \frac{L + h}{f} \left(\frac{30n}{100} - cf\right)$$

$$P_{30} = 29.5 + \frac{5}{5} (7.5 - 4)$$

$$P_{30} = 29.5 + 3.5$$

$$P_{30} = 33.$$

$$(10) M.D = \frac{\sum_{i=1}^n f_i |x - \bar{x}|}{\sum_{i=1}^n f_i}$$

$$M.D = \frac{136.4}{25} = 5.46.$$

Ans ③

$$(11) \text{ Variance} = \frac{\sum_{i=1}^n f_i^2 (x_i - \bar{x})^2}{\sum_{i=1}^n f_i}$$

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

$$\text{Variance} = 54.96$$

$$(12) \text{ Standard Deviation} = \sqrt{\text{Variance}}$$

$$SD = \sqrt{V}$$

$$SD = \sqrt{54.96}$$

$$SD = 7.41$$

$$(13) \text{ Coefficient of Variation (C.V)} = \frac{S.D}{\bar{x}} \times 100$$

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

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

$$C.V = 20.14$$

Ans ③

5) Median: is the mid value of a data set

$$\text{Median} = \left[\frac{n}{2} + 1 \right] \text{th}$$

$$= \left[\frac{25}{2} + 1 \right] \text{th}$$

$$= (12 + 1) \text{th}$$

Median = 13th, integer of a data set

$$\text{Median} = 37$$

⑥ Quartiles:

$$Q_1 = \left[\left(\frac{n}{4} \right) + 1 \right] \text{th}$$

$$= \left[\left(\frac{25}{4} \right) + 1 \right] \text{th}$$

$$= (6.25 + 1) \text{th}$$

$$= (7.25) \text{th}$$

$$= 7 \text{th}$$

$$Q_1 = 32$$

Ans ③

Part (B) Question 3

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

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

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

$$\boxed{\text{H.M} = 34.25}$$

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

$$\boxed{\text{G.M} = 36.04}$$

4) Mode: Most repeated value is called mode

So,

$$\text{Mode} = 37$$

Ans ③

(14) Quartile Deviation: \rightarrow

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

where

$$Q_3 = 41.25 \text{ and}$$

$$Q_1 = 31.75$$

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

$$Q.D = 4.75$$

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

$$\text{mean} = 36.80$$

$$\text{Mode} = 37$$

$$S.D = 7.41$$

$$SK = \frac{\text{mean} - \text{mode}}{S.D}$$

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

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

$$SK = 0.03!$$

Ans (3)

$$\begin{aligned} Q_3 &= \left[\left(\frac{3n}{4} \right) + 1 \right] \text{th} \\ &= \left[\left(\frac{3 \times 25}{4} \right) + 1 \right] \text{th} \Rightarrow (19.75) \text{th} \\ &= (20) \text{th} \text{ Integer} \end{aligned}$$

$$\boxed{Q_3 = 42}$$

(7) Deciles :

$$\begin{aligned} \text{As, } D_2 &= \left[\left(\frac{2n}{10} \right) + 1 \right] \text{th} \Rightarrow \left[\left(\frac{2 \times 25}{10} \right) + 1 \right] \text{th} \\ &= (5+1) \text{th} \Rightarrow 6 \text{th, Integer} \end{aligned}$$

$$\boxed{D_2 = 32}$$

B) Percentile :-

As

$$\begin{aligned} P_{30} &= \left[\left(\frac{30n}{100} \right) + 1 \right] \text{th} \\ &= \left[\left(\frac{30 \times 25}{100} \right) \right] \text{th} \\ &= (7.50 + 1) \text{th} \Rightarrow (8.50) \text{th} \\ P_{30} &= 9 \text{th, Integer} \end{aligned}$$

$$\boxed{P_{30} = 32}$$

Ans (3)

$$\text{(9) Range} = \text{latest value} - \text{smallest value}$$
$$R = 57 - 22$$
$$R = 35$$

$$\text{(10) Q.D} = \frac{Q_3 - Q_1}{2}$$
$$\frac{42 - 32}{2}$$
$$\boxed{\text{Q.D} = 5}$$

$$\text{(11) Skewness} = \frac{\text{Mean} - \text{mode}}{\text{S.D}}$$
$$= \frac{36.8 - 37}{7.41}$$
$$= \frac{-0.20}{7.41}$$
$$\text{Skewness} = -0.03$$

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

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

Ans (8)

$$13) \text{ Mean Deviation} = \frac{\sum_{i=1}^n |x_i - \bar{x}|}{n}$$

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

$$\text{M.D} = 5.46$$

$$14) \text{ Variance} = \frac{\sum_{i=1}^n (x_i - \bar{x})^2}{n}$$

$$= \frac{1172 \cdot 12}{25}$$

$$\text{Variance} = 46.88$$

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

$$= \sqrt{46.88}$$

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