Name : Md Raihanul Islam Bhuiyan

Id : 20101239

Section: 10

Course : STA201

Assignment: 2

Ans to the Q:N:1

| Wage Bracket | Workshops | Workers per Workshop | Total workers ($f_i$) | Mid value($x_i$) | $f_i x_i$ |
|---|---|---|---|---|---|
| 500-600 | 17 | 15 | 255 | 550 | 140250 |
| 600-700 | 28 | 11 | 308 | 650 | 200200 |
| 700-800 | 72 | 9 | 648 | 750 | 486000 |
| 800-900 | 21 | 6 | 126 | 850 | 107100 |
| 900-1000 | 12 | 5 | 60 | 950 | 57000 |
| | | | $n=1397$ | | $\Sigma f_i x_i = 990550$ |

$$\therefore \text{Mean salary} = \frac{\Sigma f_i x_i}{n}$$

$$= \frac{990550}{1397}$$

$$= 709.055$$

(Ans)

Ans to the Q: N: 2

Observation number = 120

mean = 76

∴ Total = (120×76)

= 9120

First error amount = (185 − 85)

= 100

Second error amount = (98 − 43)

= 55

∴ correct total = (9120 + 100 + 55)

= 9275

∴ Correct mean = (9275 ÷ 120)

= 77.29167

Ans: 77.29167

# Ans to the Q.N:3

Let, ~~the~~

the number of male = m

The " " female = f

So,

$m + f = 100$

$\Rightarrow m = 100 - f$ ---------- (i)

$$\frac{5200m + 5200f}{100} = 5000$$

$\Rightarrow 5200m + 5200f = 500000$

$\Rightarrow 5200(100 - f) + 5200f = 500000$

$\Rightarrow 520000 - 5200f + 5200f = 500000$

$\Rightarrow 1000f = 20000$

$\Rightarrow f = 20$

Now put $f = 20$ in (i).

$\therefore n = 100 - 20$

$= 80$

$\therefore$ Percentage of male $= \left(\frac{80}{100} \times 100\right)\%$

$= 80\%$

Percentage of female $= \left(\frac{20}{100} \times 100\right)\%$

$= 20\%$

Ans: 80% male and 20% female.

# Ans to the Q. N: 4

As this is an average of averages, we are going to do harmonic mean.

Let, the third part's speed = $x$

$$\therefore \frac{3}{\frac{1}{72}+\frac{1}{88}+\frac{1}{x}} = 68$$

$$\Rightarrow \frac{5}{198}+\frac{1}{x} = \frac{3}{68}$$

$$\Rightarrow \frac{1}{x} = \frac{127}{6732}$$

$$\Rightarrow x = \frac{6732}{127}$$

$$\therefore x = 53.00788 \text{ km/h}$$

Ans: 53.00788 km/h

# Ans to the Q: N: 5

Here, we are going to do geometric mean.

$\therefore$ Geometric mean $= \sqrt[3]{(100-40) \times (100-20) \times (100-10)}$ %

$= 75.595\%$

$\therefore$ Average rate of depriciation per year after three years $(100 - 75.595)\%$.

$= 24.405\%$ (Ans)

$\therefore$ value of the car after three years

$= 3500000 \times \left(\frac{75.595}{100}\right)^3$ Tk

$= 1511984.219$ Tk

(Ans)

## Ans to the Q. No 6

For ungrouped data,

Sample variance $s^2 = \frac{\sum_{i=1}^{n} (x_i - \bar{x})^2}{n-1}$

| $x_i$ | $x_i - \bar{x}$ | $(x_i - \bar{x})^2$ |
|---|---|---|
| 87 | -47.895 | 2293.93 |
| 103 | -31.895 | 1017.29 |
| 130 | -4.895 | 23.961 |
| 160 | 25.105 | 630.26 |
| 180 | 45.105 | 2034.46 |
| 195 | 60.105 | 3612.61 |
| 132 | -2.895 | 8.38 |
| 145 | 10.105 | 102.11 |
| 211 | 76.105 | 5791.97 |
| 105 | -29.895 | 893.718 |
| 145 | 10.105 | 102.11 |
| 153 | 18.105 | 327.97 |
| 152 | 17.105 | 292.58 |
| 138 | 3.105 | 9.64 |
| 87 | -47.895 | 2293.93 |
| 99 | -35.895 | 1288.45 |
| 93 | -41.895 | 1755.19 |
| 119 | -15.895 | 252.65 |
| 129 | -5.895 | 34.75 |
| $\sum x_i = 2563$ | | $\sum (x_i - \bar{x})^2 = 22785.951$ |

$$\bar{x} = \frac{2563}{19} = 134.895 \qquad \left[\because \bar{x} = \frac{\sum x_i}{n}\right]$$

$$\sum_{i=1}^{19} (x_i - \bar{x})^2 = 22765.951$$

∴ sample variance,

$$s^2 = \frac{22765.951}{19-1}$$

$$= 1264.775 \qquad \text{(Ans)}$$

∴ standard deviation, $s = \sqrt{1264.775}$

$$= 35.56 \qquad \text{(Ans)}$$

(b)

We know,

1 hour = 60 minutes.

$\therefore$ sample variance $s^2 = \frac{1264.775}{60^2}$

$= 0.351$ (Ans)

$\therefore$ standard deviation $s = \sqrt{0.351}$

$= 0.5927$

(Ans)

Ans to the Q: No 27

(a)

We know,

$$Q_i = \frac{i \times n}{4}$$

For ED,

$$n = 27$$

$$\therefore Q_1 = \frac{1 \times 27}{4}$$

$$= 6.75$$

$\approx$ 7 th value = 0.1 (Ans)

$$\therefore Q_2 = \frac{2 \times 27}{4}$$

$$= 13.5$$

$\approx$ 14 th value = 0.4 (Ans)

$$Q_3 = \frac{3 \times 27}{4}$$

$$= 20.25$$

$\approx$ 21 st value = 2.8 (Ans)

For Non-ED,

$n = 50$.

$\therefore Q_1 = \frac{1 \times 50}{4}$

$= 12.5$

$\simeq 13$th value $= 0.3$ (Ans)

$\therefore Q_2 = \frac{2 \times 50}{4}$

$= 25$

$\therefore Q_2 = \frac{25\text{th value} + 26\text{th value}}{2}$

$= \frac{1.5 + 1.7}{2}$

$= 1.6$ (Ans)

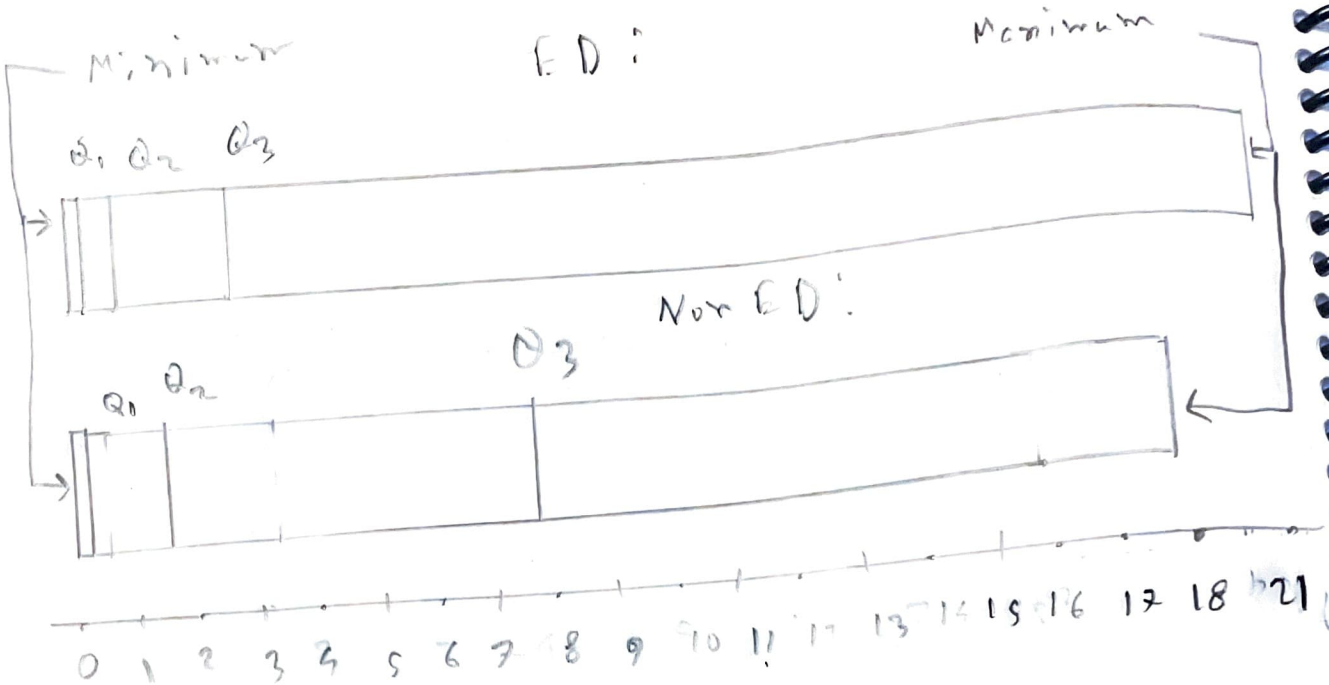
$\therefore Q_3 = \frac{3 \times 50}{4}$

$= 37.5$

$\simeq 38$ th value

$= 2.9$ (Ans)

(b)




Here, we have plotted two boxes. By comparing them, we get to know that, ~~for~~ for ED, atleast 3/4 = 75% values are less than 2.8. From Non ED box, we get to know that, half of the values are less than 1.6.