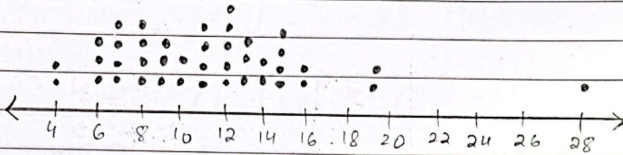


# Prob Assignment #1

Q.1

a) dotplot



b) Stem and leaf plot

Stem	Leaf
0	9 8 7 8 7 8 7 6 4 6 9 6 9 8 7
1	9 6 5 0 5 6 2 5 5 2 4 3 9 4 1 2 1 3 2 1 0 1 3
2	8

Stem	Leaf
0	4 6 6 6 7 7 7 7 8 8 8 8 9 9 9
1	0 0 1 1 1 1 2 2 2 2 2 3 3 3 4 4 5 5 5 5 6 6 9 9
2	8

Q.2.

a)  $Q_1 = \left(1 + \frac{(36+1)}{4}\right)^{th}$  where  $i^o = 1$   $n = 36$

$$\begin{aligned}
 Q_1 &= 9.25^{th} \\
 &= 9^{th} + 0.25 [10^{th} - 9^{th}] \\
 &= 48 + 0.2 [48 - 48] \\
 &= 48.
 \end{aligned}$$

Date: \_\_\_\_\_

$$Q_2 = \frac{2 \times 37}{4} = 18.5^{\text{th}}$$

$$= 59 + 0.5(60 - 59)$$

$$= 59.5$$

$$Q_3 = \frac{3 \times 37}{4} = 27.75$$

$$= 68 + 0.75(69 - 68)$$

$$= 68.75$$

$$b) IQR = Q_3 - Q_1$$

$$= 68.75 - 48 = 20.75$$

$$c) \min, Q_1, Q_2, Q_3, \max.$$

$$31, 48, 59.5, 68.75, 79$$

$$d) LL \text{ and } UL$$

$$LL = Q_1 - 1.5(IQR)$$

$$= 48 - 1.5(20.75)$$

$$= 16.875$$

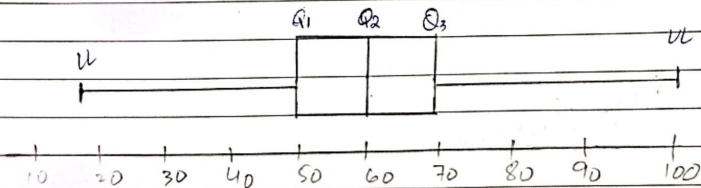
$$UP = Q_3 + 1.5(IQR)$$

$$= 68.75 + 1.5(20.75)$$

$$= 99.875$$

e) No outliers.

f) Box and plot.



Date: \_\_\_\_\_

Q.3 Sample of 36,  $\bar{x} = 58.5$ ,  $s = 13.4$ 

$$\bar{x} - 2s = 58.5 - 2(13.4) = 31.7$$

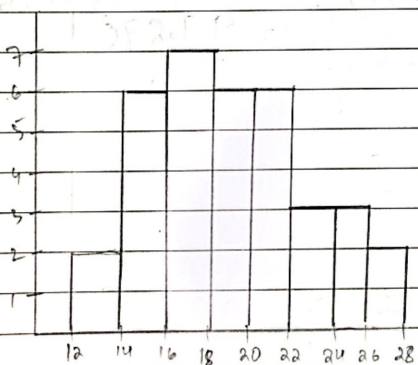
$$\bar{x} - s = 58.5 - 13.4 = 45.1$$

$$\bar{x} + s = 58.5 + 13.4 = 71.9$$

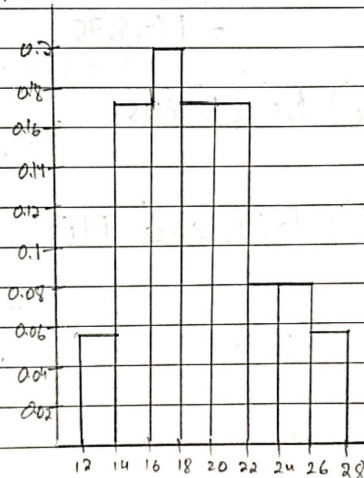
$$\bar{x} + 2s = 58.5 + 2(13.4) = 85.3$$

Q.4. Fuel tank capacity. (cut point grouping)

Class Interval	$f_i$	R.f	$\sum f_i$	$\sum f_i^2$	c.f
12-14	2	0.057	12	26	2
14-16	6	0.17	18	90	8
16-18	7	0.2	25	119	15
18-20	6	0.17	31	114	21 ✓
20-22	6	0.17	37	126	27
22-24	3	0.08	40	69	30
24-26	3	0.08	43	75	33
26-28	2	0.057	45	54	35
			693		



frequency histogram



Relative frequency histogram.



Date: \_\_\_\_\_

$$\bar{x} = \frac{\sum_{i=1}^n f_i x_i}{\sum_{i=1}^n f_i} = \frac{673}{35} = 19.23$$

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

L: Lower c.b of median class

f: freq

c: cumulative freq of preceding class

h: class width.

$$L = 18 \quad f = 6$$

$$c = 15 \quad h = 2$$

$$\frac{n}{2} = \frac{35}{2} = 17.5$$

$$= 18 + \frac{20}{6} \left( \frac{35}{2} - 15 \right)$$

$$= 18.83.$$

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

L: Lower c.b of modal class : 16

h: class width : 2

$f_m$ : frequency of modal class : 7

$f_1$ : freq of class preceding : 6

$f_2$ : " " " succeeding : 6

$$= 16 + 2 \times \left( \frac{7 - 6}{(7 - 6) + (7 - 6)} \right)$$

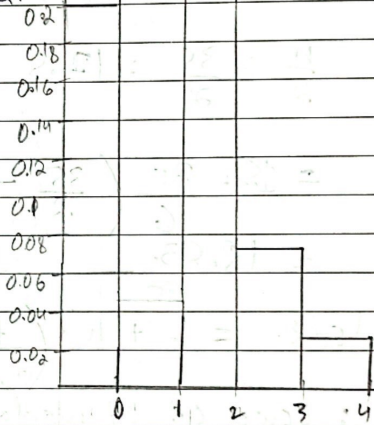
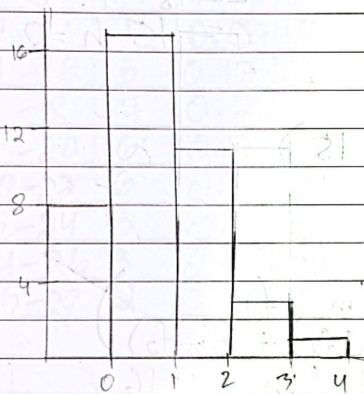
$$= 18.$$

Date: \_\_\_\_\_

Number of siblings (single value grouping)

	f	R.f	fx
0	<del>8</del> 8	0.2	0
1	16	0.425	17
2	11	0.275	22
3	3	0.075	9
4	<del>1</del> 4	0.025	4

52



$$\text{Mean} = \frac{52}{40} = 1.3$$

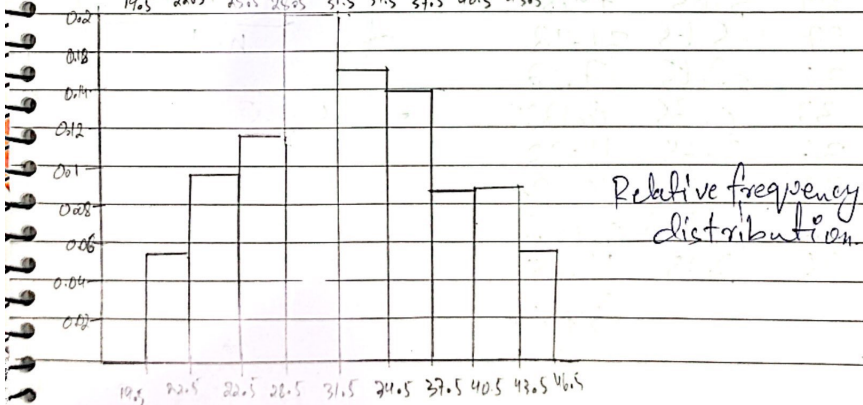
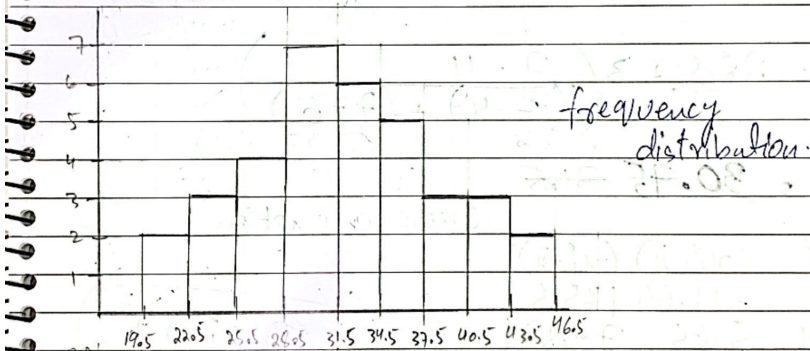
$$\begin{aligned} \text{Median} &= \frac{n+1}{2} = \frac{40+1}{2} = 20.5^{\text{th}} \\ &= \frac{1+1}{2} = 1 \end{aligned}$$

$$\text{Mode} = 1$$

Date: —

## Cheese consumption. (limit grouping)

Class interval	$f_i$	R.f	Class boundary	$x_i$	$f_i x_i$	C.f
20-22	2	0.057	20.5 - 22.5	21	42	2
23-25	3	0.085	22.5 - 25.5	24	72	5
26-28	4	0.11	25.5 - 28.5	27	108	9
29-31	6	0.2	28.5 - 31.5	30	180	16
32-34	6	0.17	31.5 - 34.5	33	198	22
35-37	5	0.14	34.5 - 37.5	36	180	27
38-40	3	0.085	37.5 - 40.5	39	117	30
41-43	3	0.085	40.5 - 43.5	42	126	33
44-46	2	0.057	43.5 - 46.5	45	90	35
4					1143	





Date: \_\_\_\_\_

$$\text{Mean} = \frac{1143}{35} = 32.65$$

Median:

$$L = 31.5 \quad c = 16$$

$$h = 3 \quad f = 6$$

$$\frac{35}{2} = 17.5$$

$$= 31.5 + \frac{3}{6} (17.5 - 16)$$

$$= 32.25$$

Mode:

$$L = 28.5 \quad f_m = 7$$

$$h = 3 \quad f_1 = 4$$

$$f_2 = 6$$

$$= 28.5 + 3 \left( \frac{7 - 4}{(7 - 4) + (7 - 6)} \right)$$

$$= 30.75 \quad 31.5$$

Cheese consumption.

$x_i$	$(x_i - \bar{x})$	$(x_i - \bar{x})^2$
21	-11.65	135.5
24	-8.65	74.82
27	-5.65	31.92
30	-2.65	7.02
33	0.35	0.1225
36	3.35	11.22
39	6.35	40.32
42	9.35	87.42
45	12.35	152.5
		541.222

$$s = \left( \frac{\sum (x_i - \bar{x})^2}{n+1} \right)^{\frac{1}{2}}$$

$$= 40.5$$

K20-1052.

$$\bar{x} = 19.23$$

fuel tank capacity Date: \_\_\_\_\_

$x_i$	$(x_i - \bar{x})$	$(x_i - \bar{x})^2$
13	-6.23	38.81
15	-4.23	17.89
17	-2.23	4.97
19	-0.23	0.05
21	1.77	3.13
23	3.77	14.21
25	5.77	33.29
27	7.77	60.37
		<u>173.2</u>

$$\text{Variance} = \left( \sqrt{\frac{173.2}{35-1}} \right)^2$$

$$= 14.34$$

$$\bar{x} = 1.3$$

Number of siblings

$x_i$	$(x_i - \bar{x})$	$(x_i - \bar{x})^2$
0	-1.3	1.69
1	-0.3	0.09
2	0.7	0.49
3	1.7	2.89
4	2.7	7.29
		<u>12.45</u>

$$\text{Variance} = \left( \sqrt{\frac{12.45}{40-1}} \right)^2$$

$$= 0.9$$