PAGE No.
DATE / /

Basic Stats - 2

Given Data:

No. of Samples = 15

data =

x_i	$x_i - \bar{x}$	$(x_i - \bar{x})^2$
1.13	$(1.13 - 1.24) = -0.11$	0.012
1.55	0.31	0.096
1.43	0.19	0.036
0.42	-0.32	0.102
1.25	0.01	0
1.36	0.12	0.014
1.32	0.08	0.06
0.85	-0.39	0.152
1.07	-0.17	0.028
1.48	0.24	0.057
1.20	-0.04	0.01
1.33	0.09	0.08
1.18	-0.06	0.03
1.22	-0.02	0
1.99	0.05	0.02
$\Sigma x_i = 18.58$		$\Sigma (x - \bar{x})^2 = 0.522$

$$\bar{x} = \frac{\Sigma x_i}{n}$$

$$= \frac{18.58}{15} = 1.24$$

PAGE No.
DATE / /

Sample deviation (S_x) $= \sqrt{\frac{\Sigma(x_i - \bar{x})^2}{n-1}}$

$= \sqrt{\frac{0.522}{14}}$

≈ 0.19

$\sigma \approx \sqrt{\frac{\Sigma(x_i - \bar{x})^2}{n}}$

$\approx \sqrt{\frac{0.522}{15}}$

≈ 0.18

a. 99% Confidence Using Sample Standard deviation.

$t \approx 2.977$ ... (from table)

Error Margin $= t \times \frac{S}{\sqrt{n}}$

$= 2.977 \times \frac{0.19}{\sqrt{15}}$

$= 0.14$

PAGE No
DATE / /

Confidence Interval $= (\bar{x} - E, \bar{x} + E)$

$= (1.24 - 0.14, 1.24 + 0.14)$

$\boxed{CI = (1.1, 1.38)}$

b. 99% Confidence using population Std. deviation.

$Z = 2.576$ ... (from table)

Error Margin $= \frac{Z \times 6}{\sqrt{n}}$

$= \frac{2.576 \times 0.18}{\sqrt{15}}$

$= 0.11$

Confidence Interval $= (\bar{x} - E, \bar{x} + E)$

$= (1.24 - 0.11, 1.24 + 0.11)$

$\boxed{CI = (1.13, 1.35)}$