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SL = 14

Q.4

SL. Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Observation	5	8	7	10	7	6	9	11	4	2	7	7	12	9
SL. Number	15	16	17	18	19	20	21	22	23	24	25			
Observation	11	3	7	8	5	6	7	6	9	11	4			

a) Estimate of mean,  $\bar{x} = \frac{1}{n} \sum x = \frac{30}{4} = 7.5$

" " total,  $\bar{x} = N\bar{x} = 25 \times 7.5 = 187.5$

$$S^2 = \frac{1}{n-1} \left[ \sum x^2 - \frac{(\sum x)^2}{n} \right] = \frac{1}{3} [228 - \frac{225}{4}] = 1$$

- Variance of sample mean  $\Rightarrow V(\bar{x}) = \frac{N-n}{Nn} S^2$

$$= \left[ \frac{255}{2} - 225 \right] \frac{1}{12} = \left[ \frac{255}{2} - 225 \right] = \frac{25}{25 \times 4} \times 1$$

$$= 0.25$$

estimate standard error,  $N\sqrt{V(\bar{x})} = (25)^{1/2} \times 0.25$

$$= 131.25$$

$\therefore S.E(\bar{x}) = \sqrt{N\sqrt{V(\bar{x})}} = \sqrt{131.25}$

$$= 11.456$$

b)  $P = \frac{n}{N} = \frac{16}{25} = 4$

Q. 5)

SLN	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
106.	4	3	0	2	6	7	4	3	2	0	1	0	9	0	6
SLN	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Ob	9	0	1	4	3	2	6	3	7	5	8	0	2	3	5

R. Num.	11	16	9	12	19
P. of signs	1	8	2	0	4

Estimate of mean,  $\bar{x} = \frac{1}{n} \sum x = 3$

" total,  $\bar{x} = N\bar{x} = 30 \times 3 = 90$

$$\sqrt{\frac{N^2 - 251}{N \times 2}} \left[ \sum x^2 - \frac{(\sum x)^2}{N} \right] = \sqrt{\frac{1}{5-1} \left[ 85 - \frac{81}{5} \right]} = 10$$

$$V(\bar{x}) = \frac{N-n}{Nn} s^2 = 1.67$$

$$\therefore N V(\bar{x}) = 1500$$

$$\therefore S.E.(\bar{x}) = \sqrt{N V(\bar{x})} = \sqrt{1500} = 38.73 \text{ A.R}$$

$$= \frac{21}{2} = 10.5 \text{ A.R}$$

$$9.6) \text{ Sample size } n = \frac{Z^2 PN}{d^2} = \frac{(1.96)^2 \times 0.45 \times 0.55}{(0.1)^2}$$

$\approx 95$

9.7)

SL. Num.	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Observation	10	7	6	9	11	4	2	7	7	9	11	45	8	7
SL. Num.	15	16	17	18	19	20	21	22	23	24	25	26		
Observation	10	7	6	9	"	4	2	7	7					

R. number	11	16	9	12
No. of marks	11	7	7	45

Estimate of mean,  $\bar{x} = \frac{1}{n} \sum x = 70$

$$S^2 = \frac{1}{n-1} \left[ \sum x^2 - \frac{(\sum x)^2}{n} \right] = \frac{1}{4-1} \left[ 22444 - \frac{4900^2}{4} \right], 339.67$$

$$V(\bar{x}) = \frac{N-n}{Nn} S^2 = 70.149$$

$$S.e(\bar{x}) = \sqrt{V(\bar{x})} = 8.375$$

$$9.8) \text{ Sample size} = \frac{Z^2 Pq}{d^2} = \frac{(1.96)^2 \times 0.3 \times 0.7}{(0.05)^2}$$

$\approx 322$