Serial	1	2	3	4	5	6	7	8	9	10	11	12	13
Observation	5	8	7	10	2	6	9	4	4	2	7	7	12

Serial	14	15	16	17	18	19	20	21	22	23	24	25
Observation	9	11	3	7	8	5	6	7	6	9	11	4

Random	5	11	17	23
Signal	7	7	7	9

N = 25

sample = 4

$k = \dfrac{25}{4}$

6.25

$$s^2 = \frac{1}{n-1}\left[\Sigma x^2 - \frac{(\Sigma n)^2}{n}\right]$$

$$= \frac{1}{4-1}\left[\underline{\quad(7+7+7+9)^2} - (7+7+7+9)\right.$$

$$= \frac{1}{4-1}\left[(7+7+7+9)^2 - \frac{(7+7+7+9)^2}{4}\right]$$

$$= 1$$

variance of simple mean $V(\bar{x})$

$$= \frac{N-n}{N n} \times S^2$$

$$= \frac{25-4}{25 \times 4} \times 1 = 0.21$$

Standard error of estimate of mean

$$= \sqrt{V(\bar{x})}$$

$$= \sqrt{0.21} = 0.458$$

The estimate of standard error

$$V(\hat{x}) = N^2 V(\bar{x}) - (25)^2 \times 0.21$$

$$= 131.25$$

$$\bar{x} = \sqrt{V(\bar{x})} = \sqrt{131.25} = 11.46$$

6)   proportion $P = \frac{3}{4} = 0.75$

Serial	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Observation	4	3	0	2	6	7	4	3	2	0	1	0	3	0	6

Serial	16	17	18	19	20	21	22	23	24	25	26	27	28	29
Observation	8	0	1	4	3	2	6	3	7	5	8	6	2	

Random Number	11	16	9	12	19
Observation	1	8	2	0	4

$$S^2 = \frac{1}{n-1} \times \left[\Sigma x^2 - \frac{(\Sigma x)^2}{n} \right]$$

$$= \frac{1}{5-1} \left[(1^2 + 8^2 + 2^2 + 0^2 + 4^2) - \frac{(1+8+2+0+4)^2}{5} \right]$$

$$= 10$$

variance of sample

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

$$= \frac{30-5}{30 \times 5} \times (10)^2$$

$$= 1.67$$

standard error of estimate of mean

$$\sqrt{V(\bar{x})} = \sqrt{1.67} = 792 \ 1.292$$

The estimate of standard error of population

$$V(\hat{x}) = N^2 \ V(\bar{x}) = (30)^2 \times 1.67$$

$$= 1503$$

$$\bar{x} = \sqrt{V(\hat{x})} = \sqrt{1503}$$

$$= 38.77$$

9.6

Proportion $P = 0.45$

margin of error $= 0.1$

$$n = \frac{z^2 \, PQ}{d^2}$$

$$= \frac{(1.96)^2 \times 0.45 \times 0.55}{(0.1)^2}$$

$$= 95.08 = 95$$

9.7

Serial	1	2	3	4	5	6	7	8	9	10	11	12
Observation	10	7	6	9	11	4	2	7	7	9	4	45
Serial	13	14	15	16	17	18	19	20	21	22	23	24
observation	8	7	10	7	6	9	11	4	2	7	7	

$N = 23$ and $n = 4$

Random nos	11	6	9	12
Observation	4	7	7	45

$$s^2 = \frac{1}{n-1} \times \left[\Sigma x^2 - \frac{(\Sigma x)^2}{n} \right]$$

$$= \frac{1}{4-1} \times (11^2 + 7^2 + 7^2 + 45^2) - \frac{(11+7+7+45)^2}{4}$$

$$= 339.67$$

variance of sample mean $V(\bar{x})$

$$= \frac{N-h}{Nn} \times s^2$$

$$= \frac{23-4}{23 \times 4} \times 339.67$$

$$= 70.15$$

standard error of estimate of mean $\sqrt{V(\bar{x})}$

$$\sqrt{70.15}$$

$$8.376$$

$$\underline{9.8}$$

Proportion $P = 0.3$

Margin of error $R = 0.05$

Size $n = \frac{z^2 p q}{d^2}$

$$= \frac{(1.96)^2 \times 0.3 \times 0.7}{(0.05)^2} \quad = 322.694$$

$$= 323$$