1] Mean

$$\bar{x} = A + h(\bar{u})$$

$$= A + h\left(\frac{\Sigma f_i u_i}{\Sigma f_i}\right)$$

2] Standard deviation

$$\sigma = \sqrt{\frac{\Sigma f_i u_i^2}{\Sigma f_i} - \left(\frac{\Sigma f_i u_i}{\Sigma f_i}\right)^2}$$

3] Coefficient of variation

$$C.V = \frac{\sigma}{A.M} \times 100$$

4] Moments

$$\mu_r' = \frac{\Sigma f_i u_i^r}{\Sigma f_i}$$

$$\mu_0 = 1$$
$$\mu_1 = 0$$
$$\mu_2 = \mu_2' - (\mu_1')^2$$
$$\mu_3 = \mu_3' - 3\mu_2'\mu_1' + 2(\mu_1')^3$$
$$\mu_4 = \mu_4' - 4\mu_3'\mu_1' + 6\mu_2'(\mu_1')^2 - 3(\mu_1')^4$$

5] Kurtosis

P	M	L
$\beta_2 < 3$	$\beta_2 = 3$	$\beta_2 > 3$

6] Skewness

$$\beta_1 = \frac{\mu_3^2}{\mu_2^3}$$

7] Kurtosis

$$\beta_2 = \frac{\mu_4}{\mu_2^2}$$

8] Variance $= \mu_2$

$$S.D = \sqrt{\mu_2}$$

9] Coefficient of correlation.

$$\bar{u} = \frac{\Sigma u_i}{n} \qquad \bar{v} = \frac{\Sigma v_i}{n}$$

$$Cov = \frac{\Sigma u_i v_i}{n} - \bar{u} \cdot \bar{v}$$

$$\sigma_u^2 = \frac{\Sigma u_i^2}{n} - (\bar{u})^2$$

$$\sigma_v^2 = \frac{\Sigma v_i^2}{n} - (\bar{v})^2$$

$$r(x,y) = r(u,v) = \frac{cov(u,v)}{\sigma_u \cdot \sigma_v}$$

10] Regression

$$y - \bar{y} = r(x,y) \cdot \frac{\sigma_y}{\sigma_x} (x - \bar{x})$$

11] Probability.

$$P(A) = 1 - P(\bar{A})$$

Binomial

12] $P(r) = {}^nC_r \, p^r q^{n-r}$

$$\text{Mean} = np$$

$$\text{Variance} = npq$$

$$\text{S.D} = \sqrt{npq}$$

13] Poission distribution

$$P(r) = \frac{e^{-z} z^r}{r!}$$

$$z = np$$

14] bisection

$$x_1 = \frac{1}{2}(a+b)$$

15] Regula Falsi

$$x = \frac{a f(b) - b f(a)}{f(b) - f(a)}$$

16] Secant method.

$$y - y_1 = \frac{y_1 - y_0}{x_1 - x_0}(x - x_1)$$

17] Newton - Raphson

$$x_n = x_{n-1} - \frac{f(x_{n-1})}{f'(x_{n-1})}$$

18] Trapezoidal rule

$$I = h\left[\frac{1}{2}(y_0+y_n)+(y_1+y_2+y_3+y_4+y_5+\cdots+y_{n-1})\right]$$

19] Simpson's (1/3)rd

+9] $$I = \frac{h}{3}\left[(y_0+y_n)+4(y_1+y_3+\cdots+y_{n-1})\right.$$
$$\left.+2(y_2+y_4+\cdots+y_{n-2})\right]$$

20] Simpson's $(3/8)^{rd}$ rule

$$I = \frac{3h}{8}\left[(y_0+y_n)+3(y_1+y_2+y_4+y_5+y_{n-1})\right.$$
$$\left.+2(y_3+y_6+y_9+\cdots+y_{n-3})\right]$$

A] Statistics

1] Measures of central tendency.
2] Measures of dispersion.
3] Coefficient of variation.
4] Moments
5] Skewness and Kurtosis.
6] Curve fitting.
7] Correlation
8] Regression

B] Probability and Probability Distribution.

1] Probability
2] Mathematical exception.
3] Binomial
4] Poisson
5]

C] Numerical methods
1] Bisection
2] Secant
3] Regula-Falsi
4] Newton-Raphson.
5] Gauss elimination.
6] LU decomposition.

D] Numerical Methods

1] Trapezoidal rule
2] Simpson's rule
3] Euler's rule
4] Modified Euler's rule
5] Runge-Kutta 4th order methods.