## Truncation and Error due to Truncation of Numbers.

Leaving out the extra digits that are not required in a number without rounding off, is called truncation or chopping off.

The difference between a numerical value X and its truncated value  $X_1$  is called truncation error and is given by  $E = X - X_1$ .

The maximum error due to truncation of a number cannot exceed the place value of the last retained digit in the number.

**Remark 1:** In truncation the numerical value of a positive number is decreased and that of a negative number is increased.

**Remark 2:** If we round off a large number of positive numbers to the same number of decimal places, then the average error due to rounding off is zero.

**Remark 3:**In case of truncation of a large number of positive numbers to the same number of decimal places the average truncation error is one half of the place value of the last retained digit.

**Remark 4:**If the number is rounded off and truncated to the same number of decimal places, then truncation error is greater than the round off error.

**Remark 5:**Round of error may be positive or negative but truncation error is always positive in case of positive numbers and negative in case of negative numbers.

Number	Approximated number obtained by	
	Chopping off	Rounding off
0.335217	0.3352	0.3352
0.666666	0.6666	0.6667
0.123451	0.1234	0.1235
0.213450	0.2134	0.2134
0.213950	0.2139	0.2140
0.335750	0.3357	0.3358
0.999999	0.9999	1.0000