

## NOTATIONS AND SYMBOLS IN SCIENCE

1. The English alphabet **a to z** is used very much in all the branches of science. Certainly in mathematics and physics. In these two subjects, even the **capital letter** and **the small letter** [upper case and lower case in computer use] have special conventions in their use. We will list some important usages.
2. The **Greek alphabet** [alpha to omega] is also used in all the branches of science. Certainly in mathematics and physics. In these two subjects even the capital letter and the small letter [upper case and lower case in computer use] have special conventions in their use. We will list some important usages. It is useful to be familiar with The **Greek alphabet**. So we will give you this list also.
3. Use of the alphabet is very important in **chemistry**. **The periodic table** of elements is one example. All students of any science must know these because we encounter chemical symbols in daily life also. My advice to all students of science : *keep a copy of the periodic table with you for reference*.
4. Another aspect of science is the **use of formulas**. For remembering formulas, notations and symbols are necessary. It is impossible to grasp higher maths without being familiar with them [=notations and symbols]. We will give you an essential list.
5. Another aspect of science is the use of **superscripts, subscripts, prefixes and suffixes**. Here, only general rules can be given. The learner has to understand from the context. Usually they are defined in the same place where they are used. We will show some examples.
6. Another aspect of science [especially in biological and medical sciences] is the common use of special terminology **with Latin and Greek origins**. We will indicate a few only. Even a list of terms used in the xi and xii stds level, needs a very large glossary.
7. Until about 50 years ago, science students used to carry with them a small reference book called '**Mathematical and Physical Constants**' [also called **Clarke's Tables**] It is not commonly seen nowadays. Remembering at least a few concepts and values is useful even in these days of the
8. web and internet. We will indicate a few.
  - 1 the **capital letter and the small letter**  
The uppercase is used for a point [in maths: geometry]. Thus A and B will be TWO POINTS. if it is written as AB it will mean the line connecting A and B. Small a and b are usually used in algebra and usually refer to quantities. In physics the same **capital letter and the small letter** may mean different quantities. Thus  $v$  stands for velocity ;  $V$  stands for volume. see list below.

## UPPER CASE ENGLISH

A area,/ any point,/ atomic mass number  
B magnetic flux density  
C capacitance  
D sometimes density  
E energy,/ electric field  
F force  
G the gravitational constant [ $=6.674 \times 10^{-11} \text{ N} \cdot \text{kg}^{-2} \cdot \text{m}^2 \cdot$ ]  
H magnetic field strength  
I intensity. / Moment of inertia,/ electric current  
J unit of energy [Joule]  
K Kelvin/ sometimes for kilo  
L inductance  
M sometimes mass  
N direction north,/ magnetic north pole  
O point of origin [0,0]  
P any point , sometimes probability  
Q quantity of heat energy  
R electrical resistance, / the gas constant [ $=8.314 \text{ Joule per kg}$ ]  
S direction south, /magnetic south pole.  
T temperature, /[time] period of oscillation  
U  
V volume, /voltage[ potential difference]  
W work  
X axis in a graph,/ vector direction  
Y axis in a graph,/ vector direction  
Z axis in a graph,/ vector direction,  
Electrical impedance, / complex number [maths]

## Lower case English

a acceleration  
b  
c speed of light [in vacuum][ $= 300,000 \text{ km/s}$ ]  
d distance, / diameter, /differentiation operator  
e elementary charge . / base of natural logarithm [ $=2.718$ ]  
f frequency, /function [as in  $f(x)$ ]  
g acceleration due to gravity [ $= 9.8 \text{ m/s}^2$  . ]  
h height ,, /planck's constant [= ]  
i electric current ,/ imaginary unit number [ $= \text{sq.root of } (-1)$  ]  
j used in place of i in elec and elec engg  
k  $i, j, k$  unit vectors in those directions  
l length  
m mass  
n any assumed general number  
o  
p momentum  
q electric charge [in Coulombs]  
r radius  
s distance, /.sometimes half the periphery of a triangle  
t time [in general]

u used sometimes for velocity  
v velocity  
w width  
x any unknown quantity [algebra]  
y generally for a dependant function ,as in  $y=f(x)$   
z

### **Greek characters and their usual meaning**

Alpha  $\alpha$  radiation type  
Beta  $\beta$  radiation type  
Gamma  $\gamma$  radiation type  
Delta  $\delta$  small increment [calculus]  
Epsilon  $\varepsilon$  permittivity [farad/ metre]  
Eta  $\eta$  coefficient of viscosity , Efficiency  
Theta  $\theta$  angle [trigonometry]  
Lambda  $\lambda$  wavelength  
Myu  $\mu$  prefix for micro  
Nu  $\nu$  frequency  
Pi [pie]  $\pi$  math. Constant [= 22/7 or 3.14]  
Rho  $\rho$  density  
Sigma  $\Sigma$  sum of [maths]  
Sigma  $\sigma$  standard deviation [maths, statistics]  
Tau  $\tau$  time constant [electronics]  
 $\tau$  New symbol [=2x pie]  
Phi  $\Phi$  magnetic flux  
Phi  $\phi$  angle [trigonometry]  
Psi  $\Psi$  wave function [ physics]  
Omega  $\omega$  angular frequency [= 2x pie x f]  
omega  $\Omega$  resistance [electrical , in ohms]

[Conventions given here refer to physics, mathematics and also used in engineering ]