FUNDAMENTAL AND DERIVED QUANTITIES

Physics is an experimental science which requires measurements. The results of measurements are described by the use of numbers. A physical quantity is usually used to describe a physical phenomenon. Physical quantities are divided into two groups which are fundamental and derived quantities. The table below shows some common fundamental and derived units.

FUNDAMENTAL QUANTITIES

These are quantities that can’t be gotten from other quantities they form the basis of other quantities (known as derived quantities) instead;

|  |  |  |  |
| --- | --- | --- | --- |
| SN | Physical Quantity | SI Units | Symbol of units |
| 1 | Mass | Kilogram |  |
| 2 | Length | Meter |  |
| 3 | Time | Seconds |  |
| 4 | Electric current | Ampere |  |
| 5 | Thermodynamic temperature | Kelvin |  |
| 6 | Luminous intensity | Candela |  |
| 7 | Quantity of substance | Mole |  |

DERIVED QUANTITIES AND UNITS

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SN | Quantity | Unit | Symbol of units |  |  |  |  |  |  |  |  |
| 1 | Area | Square meters |  |  |  |  |  |  |  |  |  |
| 2 | Volume | Cubic meters |  |  |  |  |  |  |  |  |  |
| 3 | Density | Kilogram per meter cube | or |  |  |  |  |  |  |  |  |
| 4 | Speed | Meters per second |  |  |  |  |  |  |  |  |  |
| 5 | Velocity | Meters per second |  |  |  |  |  |  |  |  |  |
| 6 | Acceleration | Meters per square second |  |  |  |  |  |  |  |  |  |
| 7 | Force | Newton | N | Kilogram meter per square second |  |  |  |  |  |  |  |
| 8 | Impulse | Newton seconds |  | Kilogram meters per second |  |  |  |  |  |  |  |
| 9 | Momentum | Newton seconds |  | Kilogram meters per second |  |  |  |  |  |  |  |
| 10 | Surface tension | Newton per meter |  |  |  |  |  |  |  |  |  |
| 11 | Pressure | Pascal |  | Newton per square meters |  |  |  |  |  |  |  |
| 12 | Energy | Joule |  | Newton meter |  |  |  |  |  |  |  |
| 13 | Work | Joule |  | Newton meter |  |  |  |  |  |  |  |
| 14 | Power | Watt |  | Joules per second |  |  |  |  |  |  |  |
| 15 | Radiant Flux | Watt |  | Joules per second |  |  |  |  |  |  |  |
| 16 | Frequency | Hertz | or p | Per second |  |  |  |  |  |  |  |
| 17 | Electric charge | Coulomb |  | Ampere second |  |  |  |  |  |  |  |
| 18 | Voltage or potential difference | Volt |  | Ampere ohms |  |  |  |  |  |  |  |
| 19 | Capacitance | Farad |  | Coulomb per volt |  |  |  |  |  |  |  |
| 20 | Electric Resistance | Ohms |  | Volt per ampere |  |  |  |  |  |  |  |
| 21 | Conductance | Siemens |  | Ampere per volt |  |  |  |  |  |  |  |
| 22 | Magnetic Flux | Weber |  |  |  |  |  |  |  |  |  |
| 23 | Magnetic flux density | Tesla |  | Weber per square meter |  |  |  |  |  |  |  |
| 24 | Inductance | Henry |  | Weber per Ampere |  |  |  |  |  |  |  |
| 25 | Luminous flux | Lumen |  |  |  |  |  |  |  |  |  |
| 26 | Illumination | Lux |  | Lumen per square meter |  |  |  |  |  |  |  |

SUPPLEMENTARY UNITS

|  |  |  |  |
| --- | --- | --- | --- |
| S/N | Quantity | Unit | Symbol |
| 1 | Plane angle | Radian | Rad |
| 2 | Solid angle | steradian | Sr |

MULTIPLES AND PREFIXES OR UNITS

These are terms

|  |  |  |
| --- | --- | --- |
| Prefix | Symbol of Prefix | Value |
| Yotta |  |  |
| Zetta |  |  |
| Eta |  |  |
| Peta |  |  |
| Tera |  |  |
| Giga |  |  |
| Mega |  |  |
| Kilo |  |  |
| Hecto |  |  |
| Deca |  |  |
| Deci |  |  |
| Centi |  |  |
| Milli |  |  |
| Micro |  |  |
| Nano |  |  |
| Pico |  |  |
| Fanto |  |  |
| Atto |  |  |
| Zepto |  |  |
| Yocto |  |  |

For example, if the unit of capacitance is farad (F), then