Physical Quantity has a numerical value and unit

- **Base Quantity** = quantities that cannot be expressed in terms of other physical quantities

- **Derived Quantity** = obtained through the product or quotient of other physical quantities

Scalar Quantity = has magnitude only

Vector quantity = has both magnitude and direction

Precision = the measurements that are having small range

Accuracy = the measurement that is close to true value

Acceleration = rate of change of velocity or change of velocity per unit time

Condition to be equilibrium = No resultant force and No resultant moment

Newton's Law

1st law of motion = an object will continue at rest or constant speed unless acted by a force

2nd law of motion = the resultant force is proportional to the rate of change of momentum

3rd law of motion = when object A and object B are in contact, the force by object A is acting equal and opposite to the force by object B

Centre of gravity = a point in a body where all the weight is considered to act

Density = mass per unit volume

Momentum = mass x velocity

Principle of conservation of momentum = Total momentum before collision = Total momentum after collision in an isolated system.

Elastic collision = Velocity of approach = velocity of separation

Archimedes' principle = upthrust on an object fully or partially immersed in a fluid is equal and opposite to the weight of fluid displaced.

Moment = product of force and perpendicular distance from pivot

Principle of moment in equilibrium = total clockwise moment = total anticlockwise moment

Work done = product of force and distance moved In the direction of force

Principle of conservation of Energy = energy cannot be created or destroyed, it can only be transformed from one to another but total energy remains constant

KE = energy that possessed by being in motion

GPE = Energy stored in a body due to its position in a gravitational field

EPE = Energy stored in a body due to compression or extension

Power = Rate of work is done

Hooke's Law = Within the limit of proportionality , the extension is directly proportional to the load applied.

Limit of proportionality = Extension will be directly proportional to force applied until this point.

Young modulus = ratio of stress over strain

- **Stress** = force acting normally per unit cross-sectional area
- **Strain** = Ratio of change in length to original length

Transverse waves = vibration / oscillation is perpendicular to direction of propagation of waves/energy

Longitudinal waves = vibration / oscillation is parallel to direction of propagation of waves/energy

Displacement = distance from equilibrium position

Amplitude = Maximum displacement of the wave

Wavelength = distance between two adjacent wavefronts

Frequency = number of oscillation in 1 second

Principle of superposition = When two or more waves meet, the resultant displacement is equal to the sum of their individual displacement

Diffraction = waves will pass through the slits and the waves spread

Stationary waves = it is produced by superposition of two identical waves of same frequency, same speed travelling in opposite direction

Progressive waves = Energy is transferred

Stationary waves = Energy is being trapped

Current = rate of charge flow

Voltage = the work done per unit charge

Potential difference = work done per unit charge across a component

Electromotive force = work done per unit charge across the whole circuit

Resistance = ratio of voltage to current

Ohm's Law = the current is directly proportional to potential difference applied across it while temperature and other physical factors are kept constant.

Kirchhoff's first law = total current at junction is equals to zero

Kirchhoff's second law = the sum of emf = sum of potential difference in a same loop.

Beta decay = it is caused by weak nuclear force

Beta negative decay = emits antineutrino

Beta positive decay / Positron = emits neutrino

Fundamental particles = any particles that cannot be broken down into any small thing/ form

Antiquark = having same mass as quark but in opposite sign of charge

Hadrons = particles that made up of quarks

- **Baryons** = particles that made up by 3 quarks - such as proton and neutrons
- **Mesons** = particles that made up by one quark and one antiquark