VESP Vision

To be the centre of excellence in the field of technical education.

Program Code:-Common to all 1st semester

Course Name:-Basic Science(Physics)

Course Code : - 22102

Course coordinator: Mrs. Deepa Gupte

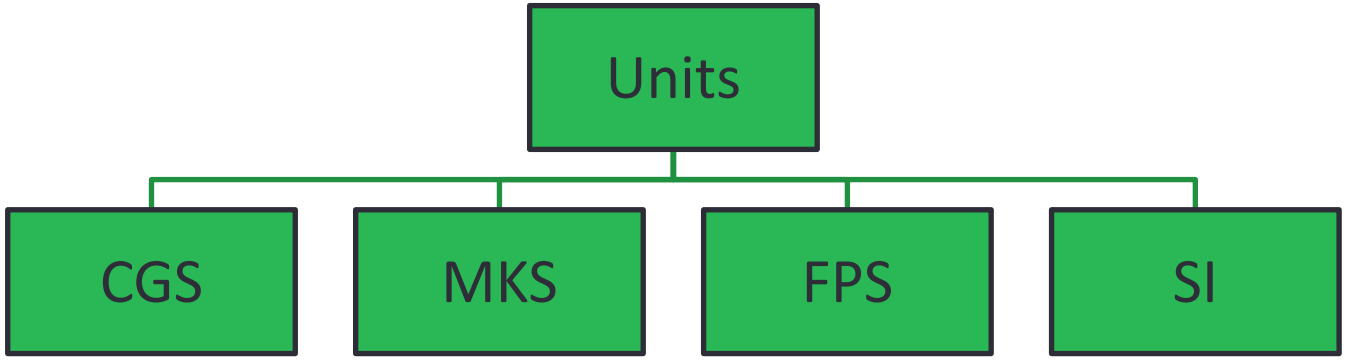
Date: 12/07/2020

Unit No:1
Unit Name: Units and Measurements

Unit Outcomes (UO1b): Describe the given measurement device and its application.
Learning Outcome (LO2) :Students will be able to explain various systems of units and its need for the measurement of physical quantities.
Contents:

a)CGS System
b)MKS System
c) FPS System
d)SI System

Concept Map



Learning Objective/ Key learning

- Students will be able to explain various systems of units for measurement of physical quantities

Systems of Units

- Length, Mass and Time are taken as basic fundamental quantities and their units are used to express different systems of unit.
  - Metric System (C.G.S, M.K.S)
  - British System (F.P.S)
  - Système Internationale (S.I)

Metric System

- Metric System: Metric system is the French system of units. In this system the different sub units are given as powers of ten. C.G.S. and M.K.S. are the sub-systems of the metric system of units. e.g. and
- C.G.S. system: In this system length is measured in centimeter, mass in gram and time in second.
- M.K.S. system: In this system length is measured in meter, mass in kilogram and time in second.

British System

- British System: In British system the basic unit of length, mass and time are Foot, Pound and Second (F.P.S.) respectively.
- In British system, conversion to sub-units is complicated.
- Again different physical quantities are measured in different sub-units.
- Hence British system is not commonly used for the measurement of the physical quantities.

Système Internationale (S.I)

- SI System: Before 1960, different countries were using different systems of units.
- Hence Scientists and Engineers had the difficulty of understanding and conversion of different systems of units.
- To overcome this difficulty in 1960, the General Conference of Weights and Measures decided to follow the same system of unit throughout the world.
- This system of unit is called International System (SI) of units.

Note: M.K.S. System is more or less the same as the SI system.

Attempt Set 1 MCQs

Set 1: Question No 1	Set 1: Question No 2	Set 1: Question No 3
Pound is the unit of mass measured in _____ system.	**Which of the following remains same for all unit system?**	**Which system measures the mass in terms of kilogram?**
Recall/ Remembering	Understanding	Application
a) CGS	a) metre	a) SI
b) MKS	b) kilogram	b) MKS
c)FPS	c) second	c) Both (a) and (b)
d)SI	d) none of these	d) CGS
Ans: <c>	**Ans: <c>**	**Ans: <b>**

CGS & MKS units

Physical Quantity	CGS Unit	MKS/ SI Unit
Area	cm^2	m^2
Volume	cm^3	m^3
Density	g/cm^3	kg/m^3
Speed or velocity	cm/s	m/s
Acceleration	cm/s^2	m/s^2
Momentum	g-cm/s	kg-m/s
Force	dyne or $g\text{-}cm/s^2$	N or $kg\text{-}m/s^2$
Impulse	dyne-s	N-s
Work	erg or dyne-cm	J or N-m
Energy	erg or dyne-cm	J or N-m
Power	erg/s	J/s or watt
Pressure or Stress	$dyne/cm^2$	Pascal or N/m^2

Multiples & Sub multiples of units

Prefix	Symbol	Multiple factor
Tera	T	10^{12}
Giga	G	10^{9}
Mega	M	10^{6}
Kilo	K	10^{3}
Hecta	H	10^{2}
Deca	da	10^{1}
Deci	d	10^{-1}

Prefix	Symbol	Multiple factor
Centi	c	10^{-2}
Milli	m	10^{-3}
Micro	µ	10^{-6}
Nano	n	10^{-9}
Pico	p	10^{-12}
Femto	f	10^{-15}
Atto	a	10^{-18}

Attempt Set 2 MCQs

Set 2: Question No 1	Set 2: Question No 2	Set 2: Question No 3
1 terabyte equals to _____ byte	**Which of the following is not the unit of power?**	**If the length of a cube is 2 cm, its volume will be _____.**
Recall/ Remembering	Understanding	Application
a) 10^{12}	a) W	a) 8 cm^2
b) 10^9	b) J/s	b) 8 cm^3
c) 10^6	c) N-m/s	c) 8cm
d) 10^3	d) N/s	d) 8 m^3
Ans: <a>	**Ans: <d>**	**Ans: <b>**