St. Mary's School, Dwarka
Holiday Homework
Class XI
Week 1
Worksheet 1

Subject- Physics

Objective:

- Revision of concepts
- Skills to carry out research and develop scientific aptitude
- Encouraging learning through experiences

Instructions:

- Neatly write all the answers in your Physics note book.
- Attempt the questions keeping in mind the weightage of each question.
- Assignment 'Summer Holiday Homework' will be created on TEAMS. PDF of handwritten work should be uploaded on it.

M.M : 25

Q1. Rule out or accept the following for kinetic energy on the basis of dimensional arguments:

(i) $3/16\ mv^2$ (ii) $\frac{1}{2}\ mv^2 + ma$ 2

Q2. Magnitude of force F experienced by a certain object moving with speed v is given by $F = Kv^2$ where K is a constant. Find the dimensions of K
2

Q3. Write the order of following length in meters:

(i) Radius of earth (ii) The height of average man

(iii) Thickness of sheet of paper (iv) The radius of hydrogen atom 2

Q4. (i)Name two quantities with (a) same dimensions (b) constant value but having dimension. 2

Q5.Write a short note on origin of nuclear force .How is nuclear force dependent on separation between nucleons? 2

Q6. Fill in the blanks: 3

i. Light year is the unit of _____.
ii. S.I. unit of angle is _____.
iii. The standard atmospheric pressure equals _____ $dyne/cm^2$.
iv. Hertz is the unit of _____.
v. Watt second is the unit of _____.

Q7. The time of oscillation *t* of a small drop of liquid under surface tension depends upon the density ρ, radius *r* and surface tension σ. Show dimensionally that: $t = \sqrt{(\rho r^3/\sigma)}$ 3

Q8. (i) If length, Time and energy are fundamental units, find the dimension of mass. 3

(ii) How many dynes make a newton?

(iii) Why do spring balances show incorrect reading after long use?

Q9. The frequency 'f' of vibration of a stretched string depends upon:

(i) its length '*l*' (ii) the mass per unit length 'm' (iii) the Tension 'T' in the string

Obtain dimensionally an expression for frequency '*f*' 3

Q10. Name the physical quantity of the dimensions given below: 3

(i) ML^0T^{-3} (ii) $ML^{-1}T^{-1}$ (iii) $M^{-1}L^3T^{-2}$

(iv) ML^2T^{-3} (v) ML^0T^{-2} (vi) T^{-1}

Research project :

SPACE PROGRAMMES

The space research activities were initiated in India during the early 1960's, when applications using satellites were in experimental stages even in the United States. With the live transmission of Tokyo Olympic Games across the Pacific by the American Satellite 'Syncom-3' demonstrating the power of communication satellites, Dr. Vikram Sarabhai, the founding father of Indian space programme, quickly recognized the benefits of space technologies for India.

As a first step, the Department of Atomic Energy formed the INCOSPAR (Indian National Committee for Space Research) under the leadership of Dr. Sarabhai and Dr. Ramanathan in 1962. The Indian Space Research Organisation (ISRO) was later formed on August 15, 1969. The prime objective of ISRO is to develop space technology and its application to various national needs. It is one of the six largest space agencies in the world. The Department of Space (DOS) and the Space Commission were set up in 1972 and ISRO was brought under DOS on June 1, 1972.

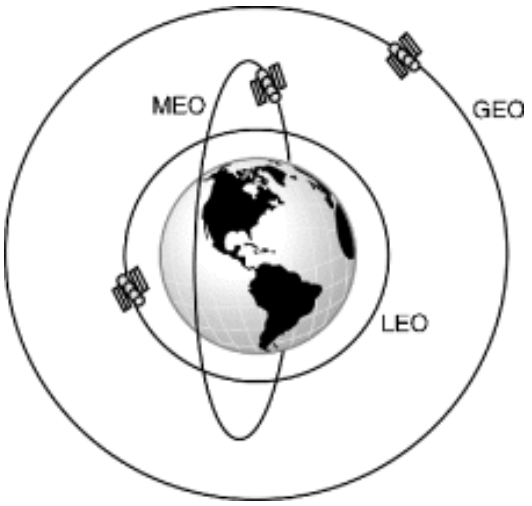
Research and find information to answer following questions:

Q1. Who is the chief of ISRO?

Q2. Write a short note about Mars Orbiter Mission (MOM) .

Q3. Refer to the figure given below and research to fill in the following table :

Type of satellite orbit	Full Form	Height	Application/use
LEO			
MEO			
GEO			


MEO
GEO
LEO