INDIAN SCHOOL MUSCAT

CLASS: 11

SUBJECT: PHYSICS WORKSHEET 1

DATE: ……..

TOPIC: **PHYSICAL WORLD AND DIMENSION**

SECTION – A CONCEPTUAL AND APPLICATION TYPE QUESTIONS

1. Arrange the fundamental forces in nature in the ascending order of their relative strength.

2. List any four characteristics of nuclear force.

3. Define light year and astronomical unit. Arrange in the descending order: light year, astronomical unit and par sec.

4. Which is the most accurate clock?

5. Distinguish between inertial mass and gravitational mass.

6. Name the device used for measuring the mass of atoms and molecules.

7. Write two advantages in choosing the wavelength of a light radiation as a standard of length.

8. What do you mean by fundamental and derived quantities?

9. Give the derived units of (i) linear momentum (ii) power (iii)stress (iv) surface tension (v) torque (vi) Force

10. Find the dimensions of the following physical quantities (i) Torque (ii) Pressure (iii) spring constant (iv) Universal gravitational constant (v) Impulse (vi) Relative density (vii) Linear magnification

11. Explain how will you find the distance of a faraway planet by the parallax method..

12. Name any three physical quantities having the same dimensions. Also write the dimension.

13. (i) Can there be a physical quantity which has no units and no dimensions. Give examples.

(ii) Can a quantity have dimensions but still have no units?

(iii) Can a quantity have units but still be dimensionless? Give examples.

13. The dimensional analysis fails to derive the relation involving more than three independent factors. Comment

14. How can random error be minimized?
15. Which quantity in a given formula should be measured most accurately?
16. State the advantages of SI over other systems of units.
17. Mention the limitations of the method of dimensional analysis.

SECTION – B NUMERICAL PROBLEMS

1. A radar signal is aimed towards a planet and its echo is received 7 minutes later. If the distance between the planet and the earth and the planet is 6.3×10^{10} m, calculate the speed of the signal.
2. The moon is observed from two diametrically opposite points A and B on earth. The angle subtended at the moon by the two directions of observation is 1° 54′. Given the diameter of the earth to be about 1.276×10^7 m, compute the distance of the moon from the earth?
3. The Sun's angular diameter is measured to be 1860″. The distance of the Sun from the Earth is 1.496×10^{11}m. What is the diameter of the Sun?
4. Write the number of significant figures in the following (i) 0.07 m (ii) 2.64×10^7
5. Add 17.35 g, 22.6 g and 8.498 g and write the result with the correct number of significant figures.
6. Find the value of x in the relation $Y = \frac{T^x . \cos\theta . \tau}{L^3}$, where Y is Young's modulus, T is time period, τ is torque and L is length.
7. A planet moves around the sun in nearly circular orbit. Its period of revolution T depends on (i) radius r of the orbit (ii) mass M of the sun and the gravitational constant G. Show dimensionally that $T^2 \propto r^3$.
8. Find the value of a force of 200 N on a system based upon the metre, the kilogram and the minute as the fundamental units.
9. The frequency f of an oscillating drop may depend on the radius r of the drop, density D of the liquid and surface tension S of the liquid. Establish an expression for f dimensionally.
10. The length of a rod as measured in an experiment was found to be 2.48 m, 2.46 m, 2.49 m, 2.50 m and 2.48 m. Find the average length, the absolute error in each observation and the percentage error.
11. If the error in the measurement of radius of a sphere is 2%. What would be the error in the volume of the sphere?
12. Convert one Newton into dynes and one Joule into ergs using dimensional analysis.