PHYSICS ASSIGNMENT NO. 1 (XI)   **Unit – I**   **Physical World and Measurement**

Q1.   What is gravitational force? Give a few examples of gravitation from daily life.

Q2.   What do you understand by nuclear force? What role does it play in daily life?

Q3.   What is physics? Discuss the relation of physics with technology.

Q4.   Name the principle on which a nuclear reactor works.

Q5.   What is the scientific principle which forms the basis of heat engine and reactor?

Q6.   What is meant by unit?   Q7. Define light year.

Q8.   Differentiate between fundamental and derived units. Give examples also.

Q9.   Define parallax and parallax angle.

Q10. How do we use the parallax method for determining the distances of nearly stars?

Q11. Ultrasonic sent by a SONAR return back to it after reflection from a rock under water after a time lapse of 2.2 second. If the velocity of ultrasonic in water is 1450 ms^{-1}, find the depth below the water surface.

Q12. What is the dimensional formula of gravitational constant?

Q13. Write down the limitations of dimensional analysis.

Q14. Write the dimensions of a and b in the relation: - $E = \dfrac{b - x^2}{at}$ Where E, x & t represent energy, distance & time respectively.

Q15. Write the dimensions of a/b in the relation $F = a\sqrt{x} + bt^2$ Where F is force, x is distance and t is time.

Q16. Check the corrections of the relation. $P = \dfrac{3g}{4\pi rG}$ Where the letters have their usual meaning.

Q17. wavelength λ associated with a moving particle depends upon its mass m, its velocity υ and Planck's constt. h. Show dimensionally that λ x $\dfrac{h}{mv}$

Q18. Derive by the method of dimensions, an expression for the energy of a body executing S.H.M., assuming that this energy depends upon; the mass (m), the frequency (v) and the amplitude of vibration (r).

Q19. Consider a simple pendulum. The period of oscillation of simple pendulum depends on its length and acceleration due to gravity. Derive the expression for its time period.

Q20. What is meant by significant figures? How are these counted?

Q21. Define the terms (i) mean absolute error. (ii) Relative error and (iii) percentage error. How are they calculated?

Q22. A physical quantity P is related to four observables a, b, c and d as follows:- $P = a^3b^2 / (\sqrt{c}\ d)$

The percentage errors of measurement in a, b, c and d are 1%, 3%, 4% and 2% resp. What is the percentage error?

Q23. Which of the following is the most precise device for measuring length :-

(a)   a vernier calipers with 20 divisions on sliding scale.   (b) a screw gauge of pitch 1 mm & 100 divisions on circular scale.

(c)   an optical instrument that can measure length to within a wavelength of light ?