

**SIR CV RAMAN COACHING CENTRE IDAPPADI ,SALEM****XI PHYSICS UNIT – 1 MODEL QUESTION PAPER – 2 - TOTAL MARK : 50 M****ANSWER ALL QUESTIONS ( 10 X 5 = 50 M) ,Date : 20.06.2024**

1. A physical quantity  $x$  is given by  $x = a^2 b^3 / C^1 (d)^{1/2}$ . If the percentage errors of measurement in  $a$ ,  $b$ ,  $c$  and  $d$  are 4%, 2%, 3% and 1% respectively then calculate the percentage error.
2. If the value of universal gravitational constant in SI is  $6.6 \times 10^{-11} \text{ Nm}^2 \text{ kg}^{-2}$ , then find its value in CGS System?
3. Obtain an expression for the time period  $T$  of a simple pendulum. The time period  $T$  depends on (i) mass ' $m$ ' of the bob (ii) length ' $l$ ' of the pendulum and (iii) acceleration due to gravity  $g$  at the place where the pendulum is suspended. (Constant  $k = 2\pi$ )
4. The radius of the circle is 3.12 m. Calculate the area of the circle with regard to significant figures
5. Assuming that the frequency  $\gamma$  of a vibrating string may depend upon i) applied force ( $F$ ) ii) length ( $A$ ) iii) mass per unit length ( $m$ ), prove that  $1/l (F/M)^{1/2}$  using dimensional analysis.
6. In a submarine equipped with sonar, the time delay between the generation of a pulse and its echo after reflection from an enemy submarine is observed to be 80 s. If the speed of sound in water is 1460 m/s. What is the distance of enemy submarine?
7. A physical quantity  $Q$  is found to depend on quantities  $x, y, z$  obeying relation  $Q = x^2 y^3 / z$  the percentage errors in  $x$ ,  $y$  and  $z$  are 2%, 3% and 1% respectively. Find the percentage error in  $Q$ .
8. Check the correctness of the following equation using dimensional analysis. Make a comment on it.  $S = ut + 1/4 at^2$  where  $s$  is the displacement,  $u$  is the initial velocity,  $t$  is the time and  $a$  is the acceleration produced
9. Arrive at Einstein's mass-energy relation by dimensional method ( $E = mc^2$ )
10. The velocity of a body is given by the equation  $v = b/t + ct^2 + dt^3$ . Find the dimensional formula for  $b$ .

**PREPARED BY****DR.G.THIRUMOORTHY. M,SC,B.ED,PH.D (PHYSICS)****GOVT ARTS COLLEGE SALEM -7****,8610560810.....**

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