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Class XI : PHYSICS

Q.No.		Ans.
1.	A Vernier calipers has 1 mm marks on the main scale. It has 20 equal divisions on the Vernier scale which mark with 16 main scale divisions. Find the least count of this Vernier calipers.	0.2 mm
2.	If dimensions of length are expressed as $G^x c^y h^z$, where G, c and h are the universal gravitational constant, speed of light, and Planck's constant respectively, then find the values of x, y, z.	$x=1/2, y=-3/2, z=1/2$
3.	Using the expression $2d \sin \theta = \lambda$, one calculates the values of d by measuring the corresponding angles θ in the range 0 to 90. The wavelength λ is exactly known and the error in θ is constant for all values of θ . Show that as θ increases from 0 the fractional error in d decreases.	N.A.
4.	A student uses a simple pendulum of exactly 1 m length to determine g, the acceleration due to gravity. He uses a stop watch with the least with the least count of 1 second for this and records 40 seconds for 20 oscillations. For this observation find the percentage error in determination of g.	5%
5.	Find the dimension of $(\mu_0 \epsilon_0)^{-1/2}$	LT^{-1}
6.	Find the expression of Planck time (t_p) in terms of the three fundamental constants : c (speed of light), G (gravitational constant) and h (Planck's constant).	$t_p = (Gh/c^5)^{1/2}$
7.	The formula $P = \frac{x^2 - b}{at}$ relates power (P), distance (x) and time (t). Find the dimensional formula for a.	$M^{-1} L^0 T^2$
8.	The speed of ripples (v) on the surface of water depends on surface tension (σ), density (ρ), and wavelength (λ). Find a relation of the speed of ripples.	$(\sigma / \rho \lambda)^{1/2}$
9.	The radius of a sphere is measured as (2.1 ± 0.5) cm. Calculate its surface area with error limits.	$(55.4 \pm 26.4) \text{ cm}^2$
10.	Calculate the focal length (f) of a spherical mirror from the following calculations: $u = (50.1 \pm 0.5)$ cm, $v = (20.1 \pm 0.2)$ cm. Given $1/f = 1/v + 1/u$.	(14.3 ± 0.4) cm