Class 11 Time : 1 hr.
13-5-2016 First Unit Test in PHYSICS M. Marks : 20

1. Write any two essential requirements of unit of a physical quantity. (1)
2. Give the dimensional formula of Impulse and kinetic energy (1)
3. An artificial satellite of mass 'm' is revolving in a circular orbit around a planet of mass 'M' and radius 'R'. If the radius of the orbit of the satellite is 'r', justify by methods of dimensions that the following equation for time period of a satellite is dimensionally correct : $T=\frac{2\pi}{R}\sqrt{\frac{r^3}{g}}$. (2)
4. The distance covered by the particle in time t is given by $X = bt^2 + ct^3$, find the dimensions of b and c. (2)
5. Using dimensional analysis, convert 60W in to a system in which 100g, 20cm and 1min are the fundamental units of mass, length and time respectively. (2)
6. What do you mean by dimensions of a physical quantity? Name any two quantities which are dimensionless and do not possess any SI unit. (2)
7. If the value of atmospheric pressure is 10^6 dyne/cm^2. Find its value in N/m^2 with the help of dimensional analysis. (2)
8. Write any two limitations of dimensional analysis and give examples in support of your answer. (2)
9. A steel ball of radius 'r' is allowed to fall under gravity through a viscous liquid of coefficient of viscosity 'η'. After sometime the ball attains a constant velocity 'v'. The velocity depends on weight of the ball 'W', the coefficient of viscosity 'η' and the radius of the ball 'r'. Using dimensional analysis, deduce a relation for velocity. (3)
10. The frequency 'n' of a stretched string depends on its length 'l', mass per unit length 'm' and tension in the string 'T'. Obtain an expression for frequency dimensionally. (3)

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