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Vacation Homework

Class XI (Physics)

1.	State and prove Bernoulli's theorem.
2.	Define coefficient of viscosity and give its SI unit. On what factors does the terminal velocity of a spherical ball falling through a viscous liquid depend? Derive the formula $\frac{2r^2g(\rho-\rho')}{9\eta}$, where the symbols have their usual meaning.
3.	a) What is the phenomenon of capillarity? Derive an expression for the rise of liquid in a capillary tube. b) What will happen if the length of the capillary tube is smaller than the height to which the liquid rises? Explain briefly.
4.	Establish a relation for the excess pressure on a liquid drop of surface tension σ, giving reason for its presence?
5.	a) Prove that the work done in stretching a wire is ½ x tension x extension. b) Prove that the work done per unit volume in stretching a wire is given by ½ x stress x strain.
6	Consider a spherical body rolling a rough inclined plane. Find the expressions for the following a) Acceleration b) Force of static friction. c) Coefficient of friction.
6.	State the theorem of parallel axis & perpendicular axis.
7.	Derive an expression for angular momentum in terms of moment of inertia and angular velocity. Hence define moment of inertia in terms of angular momentum.
8.	State Kepler's laws of planetary motion.
9	Derive an expression for kinetic energy for rotation.
10	Establish relation between α ,β and ϒ.