EASTERN UNIVERSITY, SRI LANKA

FIRST EXAMINATION IN SCIENCE - 2009/2010

FIRST SEMESTER (REPEAT)

(June 2011)

PH 105 GENERAL PHYSICS

Time: 01 hour.

Answer ALL Questions

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1. State and Prove Archimedes's Principle.

   A spherical ball of radius a and of density σ is suspended by a string in a compressed liquid of two different layers. The bottom layer is water of density ρ_1 and the upper layer is oil of density ρ_2. Derive expressions for the tension of the string at the equilibrium state when the suspended ball is:

   (i) Half submerged in water and half in oil;
   (ii) Completely submerged in water;
   (iii) Submerged half in air and half in oil.

2. Briefly explain the terms Elasticity, Plasticity, Stress, and Strain. Hence, express Hooke's Law.

   Two weightless elastic strings, each have the same natural length l. When each string is hanged vertically with masses m and $2m$ respectively, they shows the same extension of $\frac{l}{2}$. Then, when the two strings are joined together and hanged vertically with a mass m, show that the total extension of the combined string is $\frac{3l}{4}$.