Exercises 1 - Distinguish between fundamental and derived units. Give examples. 2- Give the SI units in which the following physical quantities are measured : Frequency, magnetic flux, density, magnetic flux and inductance. 3- Derive the dimensions of: (1) surface tension (2) viscosity (3) gravitational constant and (4) moment of inertia.

4- Discuss the uses of dimensional analysis.

5- What are the limitations of dimensional analysis ?

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6- Prove on the basis of dimensional analysis: T = Const.(L/g)1/2 7-For a sphere of radius(a) moving with a velocity(v) in a medium of viscosity (η) show from dimensional consideration that the backward dragiging force F is .( expressible as: F = const. (a η v

8 - What is meant by the dimensions of a physical quantity? Deduce the dimensions of Young's modulus and surface tension. 9- Explain the principle of homogeneity of a dimensional equation. Deduce the units and dimensions of constant of gravitation and coefficient of viscosity. 10-Derive, using the method of dimensions, the expression for the time period of a simple pendulum. 11-Using the dimensional analysis, derive an expression for the time period of oscillation of a simple pendulum. Assume that the time period depends on (L) length and acceleration due to gravity.Take the value of the constant k=1. 12. Show by the method of dimensions that the excess of Pressure KT inside a soap bubble is — where T is the surface tension and r is the radius of the bubble. Here, K is dimensionless constant.