

### Sheet (1)

**Derive the Dimensions and Units in SI British and French systems for the following quantities**

$$[v] =$$

$$[a] =$$

$$[F] =$$

$$[W] =$$

$$[P] =$$

$$[p] =$$

$$[V] =$$

$$[\rho] =$$

### **Conversion of units**

- 1- Convert 54 km/h into meters per second.
- 2- Convert 500 J/S into kilojoules per hour
- 3- How many kilograms are equivalent to (a) 3 Gg?    (b) 5.0 cg?    (c) 420  $\mu$ g?
- 4- How many centimeters are equivalent to (a) 5 mm?    (b) 4 Km?
- 5- Express the density 6.8 g/cm<sup>3</sup> in correct SI units.
- 6- Convert 57.6 km/h into meters per second.
- 7- Convert 18.0 m/s into kilometers per hour.
- 8- Express the following in correct SI notation:  
a- 2.4 g/cm<sup>3</sup>    b- 36  $\mu$  A/mm<sup>2</sup>

### **Dimensional analysis:**

- 1- Newton's law of universal gravity is given by  $F = G \frac{Mm}{r^2}$

where F is the force, M and m are the two masses and r is the distance between the two masses  
what is the dimension and unit of G.

- 2- Show that the expression  $x = v_0 t + \frac{1}{2} at^2$  is dimensionally correct, where x is the displacement and has dimensions of length, v is velocity, a is acceleration, and t is time.

