1. The dimensional formula of force is:
   A. $[M^1L^2T^{-2}]$
   B. $[M^1L^1T^{-2}]$
   C. $[M^0L^1T^{-2}]$
   D. $[M^1L^0T^{-2}]$ (B)

Explanation : Force is mass × acceleration. Its dimensional formula is $[M^1L^1T^{-2}]$.

2. Which of the following is a dimensionless quantity?
   A. Strain
   B. Density
   C. Pressure
   D. Frequency (A)

Explanation: Strain is the ratio of change in dimension to initial dimension, hence it is dimensionless $[M^0L^0T^0]$.

3. The dimensional formula of torque is the same as:
   A. Force
   B. Energy
   C. Pressure
   D. Power (B)

Explanation: Torque has the same dimensional formula as work/energy, which is $[M^1L^2T^{-2}]$.

4. The SI unit of surface tension is:
   A. Joule
   B. Pascal
   C. Newton metre–1
   D. Newton second (C)

Explanation : Surface tension is force per unit length. Its SI unit is N m–1.

5. The dimensional formula of momentum is:
   A. $[M^1L^1T^{-1}]$
   B. $[M^0L^1T^{-2}]$
   C. $[M^1L^2T^{-2}]$
   D. $[M^0L^0T^{-1}]$ (A)

Explanation: Momentum = mass × velocity. Dimension is $[M^1L^1T^{-1}]$.

6. Which of the following pairs has the same dimensions?
   A. Force and Work
   B. Momentum and Impulse
   C. Power and Torque
   D. Frequency and Energy (B)

Explanation: Momentum and impulse both have the dimensional formula $[M^1L^1T^{-1}]$.

7. The dimensional formula of Planck's constant is:
   A. $[M^1L^2T^{-1}]$
   B. $[M^1L^2T^{-2}]$
   C. $[M^1L^2T^0]$
   D. $[M^0L^2T^{-1}]$ (A)

Explanation: Planck's constant has the formula energy/frequency, giving $[M^1L^2T^{-1}]$.

8. The SI unit of pressure is:
   A. Watt
   B. Joule
   C. Pascal
   D. Newton metre (C)

Explanation: Pressure = force/area. Its SI unit is Pascal (N m–2).

9. The dimensional formula of density is:
   A. $[M^1L^{-3}T^0]$
   B. $[M^0L^{-3}T^1]$
   C. $[M^1L^0T^{-3}]$
   D. $[M^0L^3T^0]$ (A)

Explanation: Density = mass/volume. Dimension is $[M^1L^{-3}T^0]$.

10. The dimensional formula of the gravitational constant (G) is:
    A. $[M^1L^2T^{-2}]$
    B. $[M^0L^1T^{-2}]$
    C. $[M^{-1}L^3T^{-2}]$
    D. $[M^{-2}L^3T^{-1}]$ (C)

Explanation : From Newton's law of gravitation, G has dimension $[M^{-1}L^3T^{-2}]$.