CHAPTER-1 | Units and Measurement

QUIZ
PART-02

1. The dimensional formula of force is:
   A. $[M1L2T{-}2]$
   B. $[M1L1T{-}2]$
   C. $[M0L1T{-}2]$
   D. $[M1L0T{-}2]$　　　　　　　　　　　　(B)

   Explanation : Force is mass ✖ acceleration. Its dimensional formula is $[M1L1T{-}2]$.

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 $[M0L0T0]$.

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 $[M1L2T{-}2]$.

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. $[M1L1T{-}1]$
   B. $[M0L1T{-}2]$
   C. $[M1L2T{-}2]$
   D. $[M0L0T{-}1]$　　　　　　　　　　　(A)

   Explanation: Momentum = mass ✖ velocity. Dimension is $[M1L1T{-}1]$.

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 $[M1L1T{-}1]$.

7. The dimensional formula of Planck's constant is:
   A. $[M1L2T{-}1]$
   B. $[M1L2T{-}2]$
   C. $[M1L2T0]$
   D. $[M0L2T{-}1]$　　　　　　　　　　　(A)

   Explanation: Planck's constant has the formula energy/frequency, giving $[M1L2T{-}1]$.

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. $[M1L{-}3T0]$
   B. $[M0L{-}3T1]$
   C. $[M1L0T{-}3]$
   D. $[M0L3T0]$　　　　　　　　　　　(A)

   Explanation: Density = mass/volume. Dimension is $[M1L{-}3T0]$.

10. The dimensional formula of the gravitational constant (G) is:
    A. $[M1L2T{-}2]$
    B. $[M0L1T{-}2]$
    C. $[M{-}1L3T{-}2]$
    D. $[M{-}2L3T{-}1]$　　　　　　　　　(C)

    Explanation : From Newton's law of gravitation, G has dimension $[M{-}1L3T{-}2]$.