

Unit and Dimensions

1. Unit and Dimensions

Q1. $[ML^2 T^{-3} A^{-2}]$ is the dimensional formula of

- (A) Electric resistance
- (B) Capacity
- (C) Electric potential
- (D) Specific resistance

Correct Answer: **(A)**

Level: **Easy**

Tagging: **Analyzing**

Q2. $[ML^3 T^{-1} Q^{-2}]$ is the dimensional formula of

- (A) Resistance
- (B) Resistivity
- (C) Conductance
- (D) Conductivity

Correct Answer: **(B)**

Level: **Easy**

Tagging: **Remembering**

Q3. 'Torr' is the unit of

- (A) Pressure
- (B) Volume
- (C) Density
- (D) Flux

Correct Answer: **(A)**

Level: **Easy**

Tagging: **Remembering**

The dimensions of energy per unit volume are the same as those of

- Q4.** (a) work (b) stress
(c) pressure (d) modulus of elasticity

- (A) a,b,c
- (B) a,c,d
- (C) b,c,d
- (D) None

Correct Answer: **(C)**

Level: **Easy**

Tagging: **Remembering**

Which of the following are *not* a unit of time?

- Q5.** (a) parsec (b) light year
(c) micron (d) second

- (A) a
- (B) a,b
- (C) a,b,c
- (D) a,b,c,d

Correct Answer: **(C)**

Level: **Easy**

Tagging: **Remembering**

If e , ϵ_0 , h and c respectively represent electronic charge, permittivity of free space, Planck's con-

stant and speed of light, then $\frac{e^2}{\epsilon_0 hc}$ has the dimen-

- Q6.** sions of
- (A) current
 - (B) pressure

- (C) angular momentum
(D) angle

Correct Answer: **(D)**

Level: **Easy**

Tagging: **Remembering**

The quantities L/R and RC (where L , C and R stand for inductance, capacitance and resistance respectively) have the same dimensions as those of

- Q7.**
(A) velocity
(B) acceleration
(C) time
(D) force

Correct Answer: **(C)**

Level: **Easy**

Tagging: **Analyzing**

Q8. Using mass (M), length (L), time (T) and current (A) as fundamental quantities, the dimension of permittivity is :

- (A) $ML^{-2}T^2A$
(B) $M^{-1}L^{-3}T^4A^2$
(C) $MLT^{-2}A$
(D) $ML^2T^{-1}A^2$

Correct Answer: **(B)**

Level: **Easy**

Tagging: **Remembering**

Q9. The dimensions of self inductance are

- (A) $ML^2T^{-2}A^{-1}$
(B) $ML^2T^{-2}A^{-2}$
(C) $ML^{-2}T^{-2}A^{-1}$
(D) $ML^{-2}T^{-2}A^{-2}$

Correct Answer: **(B)**

Level: **Easy**

Tagging: **Remembering**

Which one of the following has the dimensions of $ML^{-1}T^{-2}$?

- Q10.**
(A) torque
(B) surface tension
(C) viscosity
(D) stress

Correct Answer: **(D)**

Level: **Easy**

Tagging: **Remembering**

The gravitational force F between two masses m_1 and m_2 separated by a distance r is given by $F = \frac{Gm_1m_2}{r^2}$ where G is the universal gravitational

Q11. constant. What are the dimensions of G ?

- (A) $M^{-1}L^3T^{-2}$
(B) ML^3T^{-2}

- (C) ML^2T^{-3}
 (D) $M^{-1}L^2T^{-3}$

Correct Answer: **(A)**

Level: **Easy**

Tagging: **Understanding**

Q12. The dimensions of the coefficient of viscosity are

- (A) ML^2T^{-2}
 (B) MLT^{-1}
 (C) $ML^{-1}T^{-1}$
 (D) $ML^{-1}T^{-2}$

Correct Answer: **(C)**

Level: **Easy**

Tagging: **Remembering**

Q13. The dimensions of the coefficient of thermal conductivity are

- (A) $MLT^{-3}K^{-1}$
 (B) $MLT^{-2}K^{-1}$
 (C) $MLT^{-1}K^{-1}$
 (D) $MLT^{-2}K^{-2}$

Correct Answer: **(A)**

Level: **Easy**

Tagging: **Remembering**

Q14. The dimensional formula for the physical quantity $\frac{E^2\mu_0\epsilon_0}{B^2}$ is (E = electric field and B= magnetic field)

- (A) $L^0M^0T^0$
 (B) $L^1M^0T^{-1}$
 (C) $L^{-1}M^0T^1$
 (D) $L^{1/2}M^0T^{-1/2}$

Correct Answer: **(A)**

Level: **Easy**

Tagging: **Remembering**

L, C and R represent the physical quantities inductance, capacitance and resistance, respectively. The combinations which have the dimensions of frequency are

- (a) $\frac{1}{RC}$ (b) $\frac{R}{L}$
 (c) $\frac{1}{\sqrt{LC}}$ (d) $\frac{C}{L}$

Q15.

- (A) a
 (B) a,b
 (C) a,b,c
 (D) a,b,c,d

Correct Answer: **(C)**

Level: **Easy**

Tagging: **Remembering**

Q16. Of the following quantities, which one has dimensions different from the remaining three

- (A) Energy per unit volume
- (B) Force per unit area
- (C) Product of voltage and charge per unit volume
- (D) Angular momentum

Correct Answer: **(D)**

Level: **Easy**

Tagging: **Remembering**

Q17. A pair of physical quantities having the same dimensional formula is

- (A) angular momentum and torque
- (B) torque and energy
- (C) entropy and power
- (D) power and angular momentum

Correct Answer: **(B)**

Level: **Easy**

Tagging: **Remembering**

Q18. If E and B respectively represent electric field and magnetic induction field, then the ratio $\frac{E}{B}$ has the dimensions of

- (A) displacement
- (B) velocity
- (C) acceleration
- (D) angle

Correct Answer: **(B)**

Level: **Easy**

Tagging: **Remembering**

Q19. Frequency (n) of a tuning fork depends upon length (l) of its prongs, density (ρ) and Young's modulus (Y) of its material. Then frequency and Young's modulus will be related as

- (A) $n \propto \sqrt{Y}$
- (B) $n \propto Y$
- (C) $n \propto \frac{1}{\sqrt{Y}}$
- (D) $n \propto \frac{1}{Y}$

Correct Answer: **(A)**

Level: **Easy**

Tagging: **Evaluating**

Q20. 1 a.m.u. is equivalent to

- (A) 1.6×10^{-27} kg
- (B) 934 MeV
- (C) 1.6×10^{-24} gm
- (D) All above

Correct Answer: **(D)**

Level: **Easy**

Tagging: **Remembering**

Q21. 1 ns is defined as

- (A) 10^{-9} s of Kr-clock of 1650763.73 oscillations
- (B) 10^{-9} s of Kr-clock of 6521389.63 oscillations

(C) 10^{-9} s of Cs-clock of 1650763.73 oscillations

(D) 10^{-9} s of Cs-clock of 9192631770 oscillations

Correct Answer: **(D)**

Level: **Easy**

Tagging:

Q22. 1kWh =

(A) 1000 W

(B) 36×10^5 J

(C) 1000 J

(D) 3600 J

Correct Answer: **(B)**

Level: **Easy**

Tagging: **Remembering**

Q23. A physical quantity is measured and its value is found to be nu where n = numerical value and u = unit. Then which of the following relations is true

(A) $n \propto u^2$

(B) $n \propto u$

(C) $n \propto \sqrt{u}$

(D) $n \propto 1/u$

Correct Answer: **(D)**

Level: **Easy**

Tagging: **Remembering**

Q24. A physical quantity P is given by $P=(A^3 B^{1/2}/(C^{-4} D^{3/2}))$. The quantity which brings in the maximum percentage error in P is

(A) A

(B) B

(C) C

(D) D

Correct Answer: **(C)**

Level: **Easy**

Tagging: **Understanding**

Q25. A public park, in the form of a square, has an area of $(100 \pm 0.2) \text{ m}^2$. The side of park is

(A) $(10 \pm 0.01) \text{ m}$

(B) $(10 \pm 0.1) \text{ m}$

(C) $(10.0 \pm 0.1) \text{ m}$

(D) $(10.0 \pm 0.2) \text{ m}$

Correct Answer: **(A)**

Level: **Easy**

Tagging: **Understanding**

Q26. A sextant is used to measure

(A) Area of hill

(B) Height of an object

(C) Breadth of a tower

(D) Volume of the building

Correct Answer: **(B)**

Level: **Easy**

Tagging: **Understanding**

Q27. A weber is equivalent to

(A) A m^{-2}

(B) A m^{-1}

(C) A m^2

(D) T m^2

Correct Answer: **(D)**

Level: **Easy**

Tagging: **Remembering**

Q28. Ampere-hour is a unit of

(A) Quantity of electricity

(B) Strength of electric current

(C) Power

(D) Energy

Correct Answer: **(A)**

Level: **Easy**

Tagging: **Remembering**

Q29. Crane is British unit of volume (one crane = 170.4742). convert crane into SI units.

(A) 0.170474 m^3

(B) 17.0474 m^3

(C) 0.00170474 m^3

(D) 1704.74 m^3

Correct Answer: **(A)**

Level: **Easy**

Tagging: **Remembering**

Q30. Curie is a unit of

(A) Energy of γ -rays

(B) Half life

(C) Radioactivity

(D) Intensity of γ -rays

Correct Answer: **(C)**

Level: **Easy**

Tagging: **Remembering**

Q31. Density of liquid in CGS system is 0.625 g cm^{-3} . What is its magnitude in SI system?

(A) 0.625

(B) 0.0625

(C) 0.00625

(D) 625

Correct Answer: **(D)**

Level: **Easy**

Tagging: **Remembering**

Q32. Dimension of electric current is

(A) $[M^0 L^0 T^{-1} Q]$

(B) $[ML^2 T^{-1} Q]$

(C) $[M^2 LT^{-1} Q]$

(D) $[M^2 L^2 T^{-1} Q]$

Correct Answer: **(A)**

Level: **Easy**

Tagging: **Remembering**

Q33. Dimension of R is

(A) $ML^2 T^{-1}$

(B) $ML^2 T^{-3} A^{-2}$

(C) $ML^{-1} T^{-2}$

(D) None of these

Correct Answer: **(B)**

Level: **Easy**

Tagging: **Remembering**

Q34. Dimensional formula for force is

(A) $[M^1 L^2 T^{-2}]$

(B) $[M^1 L^1 T^{-2}]$

(C) $[M^1 L^{-1} T^{-2}]$

(D) $[M^1 L^{-2} T^{-2}]$

Correct Answer: **(B)**

Level: **Easy**

Tagging: **Understanding**

Q35. Dimensional formula for the universal gravitational constant G is

(A) $[M^{-1} L^2 T^{-2}]$

(B) $[M^0 L^0 T^0]$

(C) $[M^{-1} L^3 T^{-2}]$

(D) $[M^{-1} L^3 T^{-1}]$

Correct Answer: **(C)**

Level: **Easy**

Tagging: **Remembering**

Q36. Dimensional formula of capacitance (or farad) is

(A) $M^{-1} L^{-2} T^4 A^2$

(B) $ML^2 T^4 A^{-2}$

(C) $MLT^{-4} A^2$

(D) $M^{-1} L^{-2} T^{-4} A^{-2}$

Correct Answer: **(A)**

Level: **Easy**

Tagging: **Remembering**

Q37. Dimensional formula of heat energy is

(A) $ML^2 T^{-2}$

(B) MLT^{-1}

(C) $M^0 L^0 T^{-2}$

(D) None of these

Correct Answer: **(A)**

Level: **Easy**

Tagging: **Understanding**

Q38. Dimensional formula of Stefan's constant is

(A) $[MT^{-3} K^{-4}]$

(B) $[ML^2 T^{-2} K^{-4}]$

(C) $[ML^2 T^{-2}]$

(D) $[MT^{-2} L^0]$

Correct Answer: **(A)**

Level: **Easy**

Tagging: **Remembering**

Q39. Dimensions of $1/(\mu_0 \epsilon_0)$, where symbols have their usual meaning, are

(A) $[IT^{-1}]$

(B) $[L^{-1} T]$

(C) $[L^{-2} T^2]$

(D) $[L^2 T^{-2}]$

Correct Answer: **(D)**

Level: **Easy**

Tagging: **Understanding**

Q40. Dimensions of bulk modulus are

(A) $[M^{-1} LT^{-2}]$

(B) $[ML^{-1} T^{-2}]$

(C) $[ML^{-2} T^{-2}]$

(D) $[M^2 L^2 T^{-1}]$

Correct Answer: **(B)**

Level: **Easy**

Tagging: **Remembering**

Q41. Dimensions of charge are

(A) $M^0 L^0 T^{-1} A^{-1}$

(B) $MLTA^{-1}$

(C) $T^{-1} A$

(D) TA

Correct Answer: **(D)**

Level: **Easy**

Tagging: **Remembering**

Q42. Dimensions of coefficient of viscosity are

(A) $ML^2 T^{-2}$

(B) $ML^2 T^{-1}$

(C) $ML^{-1} T^{-1}$

(D) MLT

Correct Answer: **(C)**

Level: **Easy**

Tagging: **Understanding**

Q43. Dimensions of impulse are same as that of

(A) Force

(B) Momentum

(C) Energy

(D) Acceleration

Correct Answer: **(B)**

Level: **Easy**

Tagging: **Remembering**

Q44. Dimensions of kinetic energy are

(A) $ML^2 T^{-2}$

(B) $M^2 LT^{-1}$

(C) $ML^2 T^{-1}$

(D) $ML^3 T^{-1}$

Correct Answer: **(A)**

Level: **Easy**

Tagging: **Remembering**

Q45. Dimensions of magnetic field intensity is

(A) $[M^0 L^{-1} T^0 A^1]$

(B) $[MLT^{-1} A^{-1}]$

(C) $[ML^0 T^{-2} A^{-1}]$

(D) $[MLT^{-2} A]$

Correct Answer: **(C)**

Level: **Easy**

Tagging: **Remembering**

Q46. Dimensions of potential energy are

(A) MLT^{-1}

(B) $ML^2 T^{-2}$

(C) $ML^{-1} T^{-2}$

(D) $ML^{-1} T^{-2}$

Correct Answer: **(B)**

Level: **Easy**

Tagging: **Understanding**

Q47. Dimensions of the following three quantities are the same

(A) Work, energy, force

(B) Velocity, momentum, impulse

(C) Potential energy, kinetic energy, momentum

(D) Pressure, stress, coefficient of elasticity

Correct Answer: **(D)**

Level: **Easy**

Tagging: **Remembering**

Q48. Dyne/cm² is not a unit of

(A) Pressure

(B) Stress

(C) Strain

(D) Young's modulus

Correct Answer: **(C)**

Level: **Easy**

Tagging: **Remembering**

Q49. Electric displacement is given by $D = \epsilon E$,

Here, ϵ = electric permittivity

E = electric field strength

The dimensions of electric displacement are

- (A) $[ML^{-2} TA]$
- (B) $[L^{-2} T^{-1} A]$
- (C) $[L^{-2} TA]$
- (D) None of these

Correct Answer: **(C)**

Level: **Easy**

Tagging: **Remembering**

Q50. Electron – volt is the unit of energy ($1 \text{ eV} = 1.6 \times 10^{-19} \text{ J}$). In H-atom, the binding energy of electron in first orbit is 13.6 eV. The same in joule (J) is

- (A) $10 \times 10^{-19} \text{ J}$
- (B) $21.76 \times 10^{-19} \text{ J}$
- (C) $13.6 \times 10^{-19} \text{ J}$
- (D) None of these

Correct Answer: **(B)**

Level: **Easy**

Tagging: **Remembering**

Q51. Electron volt is a unit of

- (A) Charge
- (B) Potential difference
- (C) Momentum
- (D) Energy

Correct Answer: **(D)**

Level: **Easy**

Tagging: **Remembering**

Q52. Energy per unit volume represents

- (A) Pressure
- (B) Force
- (C) Thrust
- (D) Work

Correct Answer: **(A)**

Level: **Easy**

Tagging: **Remembering**

Q53. Error in the measurement of radius of sphere is 2%. The error in the measurement of volume is

- (A) 1%
- (B) 5%
- (C) 3%
- (D) 6%

Correct Answer: **(D)**

Level: **Easy**

Tagging: **Evaluating**

Q54. Farad is not equivalent to

- (A) q/V
- (B) qv^2
- (C) q^2/J
- (D) J/V^2

Correct Answer: **(B)**

Level: **Easy**

Tagging: **Remembering**

Q55. Find the dimensions of electric permittivity

- (A) $[A^2 M^{-1} L^{-3} T^4]$
- (B) $[A^2 M^{-1} L^{-3} T^0]$
- (C) $[AM^{-1} L^{-3} T^4]$
- (D) $[A^2 M^0 L^{-3} T^4]$

Correct Answer: **(A)**

Level: **Easy**

Tagging: **Evaluating**

Q56. Force constant has the same dimensions as

- (A) Coefficient of viscosity
- (B) Surface tension
- (C) Frequency
- (D) Impulse

Correct Answer: **(B)**

Level: **Easy**

Tagging: **Remembering**

Q57. Frequency is the function of density (ρ), length (a) and surface tension (T). Then its value is

- (A) $k\rho^{1/2} a^{3/2}/\sqrt{T}$
- (B) $k\rho^{3/2} a^{3/2}/\sqrt{T}$
- (C) $k\rho^{1/2} a^{3/2}/T^{3/4}$
- (D) None of these

Correct Answer: **(A)**

Level: **Easy**

Tagging: **Remembering**

Q58. From the dimensional consideration, which of the following equation is correct

- (A) $T=2\pi r\sqrt{(R^3/GM)}$
- (B) $T=2\pi\sqrt{(GM/R^3)}$
- (C) $T=2\pi\sqrt{(GM/(GR^2))}$
- (D) $T=2\pi\sqrt{(R^2/GM)}$

Correct Answer: **(A)**

Level: **Easy**

Tagging: **Remembering**

Q59. $h/2\pi$ is the dimension of

- (A) Velocity
- (B) Momentum
- (C) Energy
- (D) Angular momentum

Correct Answer: **(D)**

Level: **Easy**

Tagging: **Understanding**

Q60. Hertz is the unit for

- (A) Frequency
- (B) Force
- (C) Electric charge
- (D) Magnetic flux

Correct Answer: **(A)**

Level: **Easy**

Tagging: **Remembering**

Q61. Identify the pair which has different dimensions

- (A) Planck's constant and angular momentum
- (B) Impulse and linear momentum
- (C) Angular momentum and frequency
- (D) Pressure and Young's modulus

Correct Answer: **(C)**

Level: **Easy**

Tagging: **Remembering**

Q62. Identify the pair whose dimensions are equal

- (A) Torque and work
- (B) Stress and energy
- (C) Force and stress
- (D) Force and work

Correct Answer: **(A)**

Level: **Easy**

Tagging:

Q63. If 3.8×10^{-6} is added to 4.2×10^{-5} giving due regard to significant figures, then the result will be

- (A) 458×10^{-5}

- (B) 4.6×10^{-5}
 (C) 4.5×10^{-5}
 (D) None of the above

Correct Answer: **(B)**

Level: **Easy**

Tagging:

Q64. If C and R represent capacitance and resistance respectively, then the dimensions of RC are

- (A) $M^0 L^0 T^2$
 (B) $M^0 L^0 T$
 (C) ML^{-1}
 (D) None of these above

Correct Answer: **(B)**

Level: **Easy**

Tagging:

Q65. If u_1 and u_2 are the units selected in two systems of measurement and n_1 and n_2 their numerical values, then

- (A) $n_1 u_1 = n_2 u_2$
 (B) $n_1 u_1 + n_2 u_2 = 0$
 (C) $n_1 n_2 = u_1 u_2$
 (D) $(n_1 + u_1) = (n_2 + u_2)$

Correct Answer: **(A)**

Level: **Easy**

Tagging:

Q66. If $1 \text{ g cm s}^{-1} = x \text{ newton-second}$, then the number x is equal to

- (A) 1×10^{-3}
 (B) 3.6×10^{-3}
 (C) 1×10^{-5}
 (D) 6×10^{-4}

Correct Answer: **(C)**

Level: **Easy**

Tagging:

Q67. If C and L denote capacitance and inductance respectively, then the dimensions of LC are

- (A) $M^0 L^0 T^0$
 (B) $M^0 L^0 T^2$
 (C) $M^2 L^0 T^2$
 (D) MLT^2

Correct Answer: **(B)**

Level: **Easy**

Tagging:

Q68. If C be the capacitance and V be the electric potential, then the dimensional formula of CV^2 is

- (A) $[ML^{-3} TA]$
 (B) $[K^0 LT^{-2} A^0]$
 (C) $[ML^1 T^{-2} A^{-1}]$
 (D) $[ML^2 T^{-2} A^0]$

Correct Answer: **(D)**

Level: **Easy**

Tagging:

Q69. If C is capacitance and q is charge, then the dimension of q^2/C is same as that of

- (A) Work
 (B) Angular momentum
 (C) Force
 (D) Torque

Correct Answer: **(A)**

Level: **Easy**

Tagging:

Q70. If C the restoring couple per unit radian twist and I is the moment of inertia, then the dimensional representation of $2\pi\sqrt{I/C}$ will be

(A) $[M^0 L^0 T^{-1}]$

(B) $[M^0 L^0 T^0]$

(C) $[M^0 L^1 T^{-1}]$

(D) $[M^2 L^2 T^{-2}]$

Correct Answer: **(A)**

Level: **Easy**

Tagging:

Q71. If E,m,J and G represent energy, mass, angular momentum and gravitational constant respectively, then the dimensional formula of $EJ^2/m^5 G^2$ is

(A) $[MLT^{-2}]$

(B) $[M^0 L^0 T]$

(C) $[M^0 L^2 T^0]$

(D) Dimensionless

Correct Answer: **(D)**

Level: **Easy**

Tagging:

Q72. If E,M,L and G denote energy, mass, angular momentum and gravitational constant respectively, then the quantity $(EL^2/M^5 G^2)$ has the dimensions of

(A) Angle

(B) Length

(C) Mass

(D) Time

Correct Answer: **(A)**

Level: **Easy**

Tagging:

Q73. If E= energy, G= gravitational constant, I= impulse and M= mass, then dimensions of $(GIM^2)/E^2$ are same as that of

(A) Time

(B) Mass

(C) Length

(D) Force

Correct Answer: **(A)**

Level: **Easy**

Tagging:

Q74. If energy (E), velocity (u) and force (F) be taken as fundamental quantity, then what are the dimensions of mass

(A) Eu^2

(B) Eu^{-2}

(C) Fu^{-1}

(D) Fu^{-2}

Correct Answer: **(B)**

Level: **Easy**

Tagging:

Q75. If error in radius is 3%, what is error in volume of sphere?

(A) 3%

(B) 27%

(C) 9%

(D) 6%

Correct Answer: **(C)**

Level: **Easy**

Tagging:

Q76. If F denotes force and t time, then in equation $F=at^{-1}+ bt^2$, the dimensions of a and b respectively are

(A) $[LT^{-4}]$ and $[LT^{-1}]$

(B) $[LT^{-1}]$ and $[LT^{-4}]$

(C) $[MLT^{-4}]$ and $[MLT^{-1}]$

(D) $[MLT^{-1}]$ and $[MLT^{-4}]$

Correct Answer: **(D)**

Level: **Easy**

Tagging:

Q77. If $f=x^2$, then the relative error in f is

- (A) $2\Delta x/x$
- (B) $(\Delta x)^2/x$
- (C) $\Delta x/x$
- (D) $(\Delta x)^2$

Correct Answer: **(A)**

Level: **Easy**

Tagging:

Q78. If force (F), length (L) and time (T) are assumed to be the fundamental units, then the dimensional formula of the mass will be

- (A) $[FL^{-1} T^2]$
- (B) $[FL^{-1} T^{-2}]$
- (C) $[FL^{-1} T^{-1}]$
- (D) $[FL^2 T^{-2}]$

Correct Answer: **(A)**

Level: **Easy**

Tagging:

Q79. If K denotes coefficient of thermal conductivity, d the density and c the specific heat, the unit of X , where $X=K/dc$ will be

- (A) cm sec^{-1}
- (B) $\text{cm}^2 \text{sec}^{-2}$
- (C) cm sec
- (D) $\text{cm}^2 \text{sec}^{-1}$

Correct Answer: **(D)**

Level: **Easy**

Tagging:

Q80. If L, C and R denote inductance, capacitance and resistance respectively, then which of the following combination has the dimension of time?

- (A) C/L
- (B) $1/RC$
- (C) L/R
- (D) RL/C

Correct Answer: **(C)**

Level: **Easy**

Tagging:

Q81. If L, C and R denote the inductance, capacitance and resistance respectively, the dimensional formula for $C^2 LR$ is

- (A) $[ML^{-2} T^{-1} I^0]$
- (B) $[M^0 L^0 T^3 I^0]$
- (C) $[M^{-1} L^{-2} T^6 I^2]$
- (D) $[M^0 L^0 T^2 I^0]$

Correct Answer: **(B)**

Level: **Easy**

Tagging:

Q82. If L, C and R represent inductance, capacitance and resistance respectively, then which of the following does not represent dimensions of frequency

- (A) $1/RC$
- (B) R/L
- (C) $1/\sqrt{LC}$
- (D) C/L

Correct Answer: **(D)**

Level: **Easy**

Tagging:

Q83. If $L=2.331 \text{ cm}$, $B=2.1 \text{ cm}$, then $L+B=$

- (A) 4.431 cm
- (B) 4.43 cm
- (C) 4.4 cm

(D) 4 cm

Correct Answer: **(C)**

Level: **Easy**

Tagging:

Q84. If $L=2.331$ cm, $B=2.1$ cm, then $L+B$ is equal to

(A) 4.431 cm

(B) 4.43 cm

(C) 4.4 cm

(D) 4 cm

Correct Answer: **(C)**

Level: **Easy**

Tagging:

Q85. If P represents radiations pressure, c represents speed of light and Q represents radiation energy striking a unit area per second, the non-zero integers x, y and z such that $P^x Q^y c^z$ is dimensionless, are

(A) $x=1, y=1, z=-1$

(B) $x=1, y=-1, z=1$

(C) $x=-1, y=1, z=1$

(D) $x=1, y=1, z=1$

Correct Answer: **(B)**

Level: **Easy**

Tagging:

Q86. If pressure P , velocity V and time T are taken as fundamental physical quantities, the dimensional formula of force is

(A) $PV^2 T^2$

(B) $P^{-1} V^2 T^{-2}$

(C) PVT^2

(D) $P^{-1} VT^2$

Correct Answer: **(A)**

Level: **Easy**

Tagging:

Q87. If the acceleration due to gravity is 10ms^{-2} and the units of length and time are changed in kilometer and hour respectively, the numerical value of acceleration is

(A) 360000

(B) 72000

(C) 36000

(D) 129600

Correct Answer: **(D)**

Level: **Easy**

Tagging:

Q88. If the constant of gravitation (G), Planck's constant (h) and the velocity of light (c) be chosen as fundamental units. The dimension of the radius of gyration is

(A) $h^{1/2} c^{-3/2} G^{1/2}$

(B) $h^{1/2} c^{3/2} G^{1/2}$

(C) $h^{1/2} c^{-3/2} G^{-1/2}$

(D) $h^{-1/2} c^{-3/2} G^{1/2}$

Correct Answer: **(A)**

Level: **Easy**

Tagging:

Q89. If the dimensions of a physical quantity are given by $M^a L^b T^c$, then the physical quantity will be

(A) Pressure if $a=1, b=-1, c=-2$

(B) Velocity if $a=1, b=0, c=-1$

(C) Acceleration if $a=1, b=1, c=-2$

(D) Force if $a=0, b=-1, c=-2$

Correct Answer: **(A)**

Level: **Easy**

Tagging:

Q90. If the error in the measurement of radius of a sphere is 2%, then the error in the determination of volume of the sphere will be

(A) 8%

(B) 2%

(C) 4%

(D) 6%

Correct Answer: **(D)**

Level: **Easy**

Tagging:

Q91. If the length of a rectangle $l=10.5$ cm, breadth $b=2.1$ cm and minimum possible measurement by scale = 0.1 cm, then the area is

(A) 22.0 cm^2

(B) 22.1 cm^2

(C) 22.05 cm^2

(D) 22 cm^2

Correct Answer: **(A)**

Level: **Easy**

Tagging:

Q92. If the length of rod A is (3.25 ± 0.01) cm and that of B is (4.19 ± 0.01) cm, then the rod B is longer than rod A by

(A) (0.94 ± 0.00) cm

(B) (0.94 ± 0.01) cm

(C) (0.94 ± 0.02) cm

(D) (0.94 ± 0.005) cm

Correct Answer: **(C)**

Level: **Easy**

Tagging:

Q93. If the length of rod A is 3.25 ± 0.01 cm and that of B is 4.19 ± 0.01 cm then the rod B is longer than rod A by

(A) 0.94 ± 0.00 cm

(B) 0.94 ± 0.01 cm

(C) 0.94 ± 0.02 cm

(D) 0.94 ± 0.005 cm

Correct Answer: **(C)**

Level: **Easy**

Tagging:

Q94. If the radius of the sphere is (5.3 ± 0.1) cm. Then percentage error in its volume will be

(A) $3 + 6.01 \times 100/5.3$

(B) $1/3 \times 0.01 \times 100/5.3$

(C) $(3 \times 0.01/5.3) \times 100$

(D) $0.1/5.3 \times 100$

Correct Answer: **(C)**

Level: **Easy**

Tagging:

Q95. If the unit of length and force be increased four times, then the unit of energy is

(A) Increased 4 times

(B) Increased 8 times

(C) Increased 16 times

(D) Decreased 16 times

Correct Answer: **(C)**

Level: **Easy**

Tagging:

Q96. If the units of M and L are increased three times, then the unit of energy will be increased by

(A) 3 times

(B) 6 times

(C) 27 times

(D) 81 times

Correct Answer: **(C)**

Level: **Easy**

Tagging:

Q97. If the units of mass, length and time are doubled unit of angular momentum will be

(A) Doubled

(B) Tripled

(C) Quadrupled

(D) Eight times the original value

Correct Answer: **(C)**

Level: **Easy**

Tagging:

Q98. If the velocity of light (c), gravitational constant (G) and Planck's constant (h) are chosen as fundamental units, then the dimensions of mass in new system is

- (A) $c^{1/2} G^{1/2} h^{1/2}$
- (B) $c^{1/2} G^{1/2} h^{-1/2}$
- (C) $c^{1/2} G^{-1/2} h^{1/2}$
- (D) $c^{-1/2} G^{1/2} h^{1/2}$

Correct Answer: **(C)**

Level: **Easy**

Tagging:

Q99. If the velocity v (in cm s^{-1}) of a particle is given in terms of t (in second) by the relation $v = at + b/(t+c)$ then, the dimensions of a, b and c are
 $a \ b \ c$

- (A) $[L][LT][T^2]$
- (B) $[L^2][T][LT^{-2}]$
- (C) $[LT^2][LT][L]$
- (D) $[LT^{-2}][L][T]$

Correct Answer: **(D)**

Level: **Easy**

Tagging:

Q100. If velocity v , acceleration A and force F are chosen a fundamental quantities, then the dimensional formula of angular momentum in terms of v, A and F would be

- (A) $FA^{-1}v$
- (B) Fv^3A^{-2}
- (C) Fv^2A^{-1}
- (D) $F^2v^2A^{-1}$

Correct Answer: **(B)**

Level: **Easy**

Tagging:

Q101. If voltage $V = (100 \pm 5)$ volt and current $I = (10 \pm 0.2)$ A, the percentage error in resistance R is

- (A) 5.20%
- (B) 25%
- (C) 7%
- (D) 10%

Correct Answer: **(C)**

Level: **Easy**

Tagging:

Q102. If $x = at + bt^2$, where x is the distance travelled by the body in kilometre while t is the time in second, then the units of b are

- (A) km/s
- (B) km-s
- (C) km/s^2
- (D) km-s^2

Correct Answer: **(C)**

Level: **Easy**

Tagging:

Q103. If $x = a - b$, then the maximum percentage error in the measurement of x will be?

- (A) $((\Delta a + \Delta b)/(a - b)) \times 100\%$
- (B) $(\Delta a/a - \Delta b/b) \times 100\%$
- (C) $(\Delta a/(a - a) + \Delta b/(a - b)) \times 100\%$
- (D) $(\Delta a/(a - a) - \Delta b/(a - b)) \times 100\%$

Correct Answer: **(A)**

Level: **Easy**

Tagging:

Q104. In a new system of units, unit of mass is 10 kg, unit of length is 1 km and unit of time is 1 min. The value of 1 joule in this new hypothetical system is

- (A) 3.6×10^{-4} new units
- (B) 6×10^7 new units
- (C) 10^{11} new units
- (D) 1.67×10^4 new units

Correct Answer: **(A)**

Level: **Easy**

Tagging:

Q105. In an experiment the angles are required to be measured using an instrument. 29 divisions of the main scale exactly coincide with the 30 divisions of the vernier scale. If the smallest division of the main scale is half-a-degree ($=0.5^\circ$) then the least count is

- (A) One minute
- (B) Half minute
- (C) One degree
- (D) Half-degree

Correct Answer: **(A)**

Level: **Easy**

Tagging:

Q106. In an experiment, the following observation's were recorded: $L=2.820$ m, $M=3.00$ kg, $l=0.087$ cm, diameter $D=0.041$ cm. Taking $g=9.81$ m/s² using the formula,

$Y=4MgL/(\pi D^2 l)$, the maximum permissible error in Y is

- (A) 7.96%
- (B) 4.56%
- (C) 6.50%
- (D) 8.42%

Correct Answer: **(C)**

Level: **Easy**

Tagging:

Q107. In an experiment, to measure the height of a bridge by dropping stone into water underneath, if the error in measurement of time is 0.1s at the end of 2s, then the error in estimation of height of bridge will be

- (A) 0.49 m
- (B) 0.98 m
- (C) 1.96 m
- (D) 2.12 m

Correct Answer: **(C)**

Level: **Easy**

Tagging:

Q108. In the context of accuracy of measurement and significant figures in expressing results of experiment, which of the following is/are correct

- (1) Out of the two measurements 50.14 cm and 0.00025 ampere, the first one has greater accuracy
- (2) If one travels 478 km by rail and 397 m. by road, the total distance traveled is 478 km.

- (A) Only (1) is correct
- (B) Only (2) is correct
- (C) Both are correct
- (D) None of them is correct

Correct Answer: **(C)**

Level: **Easy**

Tagging:

Q109. In the equation $S_{nth} = u + a/2 (2n-1)$, the letters have their usual meanings. The dimensional formula of S_{nth} is

- (A) $[ML^0 T]$
- (B) $[ML^{-1} T^{-1}]$
- (C) $[M^0 L T^{-1}]$
- (D) $[M^0 L T^0]$

Correct Answer: **(C)**

Level: **Easy**

Tagging:

Q110. In the equation $y = a \sin(\omega t + kx)$, the dimensional formula of ω is

- (A) $[M^0 L^0 T^{-1}]$

- (B) $[M^0 L T^{-1}]$
 (C) $[ML^0 T^0]$
 (D) $[M^0 L^{-1} T^0]$

Correct Answer: **(A)**

Level: **Easy**

Tagging:

Q111. In the following list, the only pair which have different dimensions, is

- (A) Linear momentum and moment of a force
 (B) Planck's constant and angular momentum
 (C) Pressure and modulus of electricity
 (D) Torque and potential energy

Correct Answer: **(A)**

Level: **Easy**

Tagging:

Q112. In the formula, $a=3bc^2$, a and c have dimensions of electric capacitance and magnetic induction respectively. What are dimensions of b in MKS system?

- (A) $[M^{-3} L^{-2} T^4 Q^4]$
 (B) $[M^{-3} T^4 Q^4]$
 (C) $[M^{-3} T^3 Q]$
 (D) $[M^{-3} L^2 T^4 Q^{-4}]$

Correct Answer: **(A)**

Level: **Easy**

Tagging:

Q113. In the relation $P=\alpha/\beta e^{\alpha Z/k\theta}$ P is pressure, Z is the distance, k is Boltzmann's constant and θ is the temperature. The dimensional formula of β will be

- (A) $[M^0 L^2 T^0]$
 (B) $[M^1 L^2 T^1]$
 (C) $[M^1 L^0 T^{-1}]$
 (D) $[M^0 L^2 T^{-1}]$

Correct Answer: **(A)**

Level: **Easy**

Tagging:

Q114. In the relation $y=a \cos(\omega t-kx)$, the dimensional formula for k is

- (A) $[M^0 L^{-1} T^{-1}]$
 (B) $[M^0 L T^{-1}]$
 (C) $[M^0 L^{-1} T^0]$
 (D) $[M^0 L T]$

Correct Answer: **(C)**

Level: **Easy**

Tagging:

Q115. In the relation $y=r \sin (\omega t-kx)$, the dimensions of ω/k are

- (A) $[M^0 L^0 T^0]$
 (B) $[M^0 L^1 T^{-1}]$
 (C) $[M^0 L^0 T^1]$
 (D) $[M^0 L^1 T^0]$

Correct Answer: **(B)**

Level: **Easy**

Tagging:

Q116. In which of the following system of units, weber is the unit of magnetic flux

- (A) CGS
 (B) MKS
 (C) SI
 (D) None of these

Correct Answer: **(C)**

Level: **Easy**

Tagging:

Q117. In $S = a + bt + ct^2$, S is measured in metre and t in second. The unit of c is

- (A) None
- (B) m
- (C) ms^{-1}
- (D) ms^{-2}

Correct Answer: **(D)**

Level: **Easy**

Tagging:

Q118. Kilowatt-hour is a unit of

- (A) Electrical charge
- (B) Energy
- (C) Power
- (D) Force

Correct Answer: **(B)**

Level: **Easy**

Tagging:

Q119. Length is measured in metre and time in second as usual. But a new unit of mass is so chosen that $G=1$. This new unit of mass is equal to

- (A) $1.5 \times 10^7 \text{ kg}$
- (B) $1.5 \times 10^{10} \text{ kg}$
- (C) $6.67 \times 10^{-11} \text{ kg}$
- (D) $6.67 \times 10^{-8} \text{ kg}$

Correct Answer: **(B)**

Level: **Easy**

Tagging:

Q120. Let us choose a new unit of length such that the velocity of light in vacuum is unity. If light takes 8 min and 20 sec to cover the distance between sun and earth, this distance in terms of the new unit is

- (A) 5
- (B) 50
- (C) 500
- (D) 3×10^8

Correct Answer: **(C)**

Level: **Easy**

Tagging:

Q121. Light year is a unit of

- (A) Time
- (B) Mass
- (C) Distance
- (D) Energy

Correct Answer: **(C)**

Level: **Easy**

Tagging:

Q122. Linear momentum and angular momentum have the same dimensions in

- (A) Mass and length
- (B) Length and time
- (C) Mass and time
- (D) Mass, length and time

Correct Answer: **(C)**

Level: **Easy**

Tagging:

Q123. $\text{ML}^{-1} \text{T}^{-2}$ represents

- (A) Stress
- (B) Young's Modulus
- (C) Pressure
- (D) All of the above three quantities

Correct Answer: **(D)**

Level: **Easy**

Tagging:

Q124. Number of base SI unit is

- (A) 4
- (B) 7
- (C) 3
- (D) 5

Correct Answer: **(B)**

Level: **Easy**

Tagging:

Q125. Oersted is a unit of

- (A) Dip
- (B) Magnetic intensity
- (C) Magnetic moment
- (D) Pole strength

Correct Answer: **(B)**

Level: **Easy**

Tagging:

Q126. One is equivalent to 931 MeV energy. The rest mass of electron is 9.1×10^{-31} kg, the Mass equivalent energy is

(1 amu = 1.67×10^{-17} kg)

- (A) 0.5073 MeV
- (B) 0.693 MeV
- (C) 4.0093 MeV
- (D) None of these

Correct Answer: **(A)**

Level: **Easy**

Tagging:

Q127. One light year is defined as the distance travelled by light in one year. The speed of light is 3×10^8 ms⁻¹. The same in metre is

- (A) 3×10^{12} m
- (B) 9.461×10^{15} m
- (C) 3×10^{15} m
- (D) None of these

Correct Answer: **(B)**

Level: **Easy**

Tagging:

Q128. One million electron volt (1 MeV) is equal to

- (A) 10^5 eV
- (B) 10^6 eV
- (C) 10^4 eV
- (D) 10^7 eV

Correct Answer: **(B)**

Level: **Easy**

Tagging:

Q129. One nanometre is equal to

- (A) 10^9 mm
- (B) 10^{-6} cm
- (C) 10^{-7} cm
- (D) 10^{-9} cm

Correct Answer: **(C)**

Level: **Easy**

Tagging:

Q130. One side of a cubical block is measured with the help of a vernier callipers of vernier constant 0.01 cm. This side comes out to be 1.23 cm. What is the percentage error in the measurement of area?

- (A) $1.23/0.01 \times 100$
- (B) $0.01/1.23 \times 100$
- (C) $2 \times 0.01/1.23 \times 100$

(D) $3 \times 0.01/1.23 \times 100$

Correct Answer: **(C)**

Level: **Easy**

Tagging:

Q131. Out of the following four dimensional quantities, which one qualifies to be called a dimensional constant?

- (A) Acceleration due to gravity
- (B) Surface tension of water
- (C) Weight of a standard kilogram mass
- (D) The velocity of light in vacuum

Correct Answer: **(D)**

Level: **Easy**

Tagging:

Q132. Out of the following pairs, which one does not have identical dimensions

- (A) Moment of inertia and moment of force
- (B) Work and torque
- (C) Angular momentum and Planck's constant
- (D) Impulse and momentum

Correct Answer: **(A)**

Level: **Easy**

Tagging:

Q133. Out of the following which pair of quantities do not have same dimensions

- (A) Planck's constant and angular momentum
- (B) Work and energy
- (C) Pressure and Young's modulus
- (D) Torque and moment of inertia

Correct Answer: **(D)**

Level: **Easy**

Tagging:

Q134. Planck's constant has the dimensions (unit) of

- (A) Energy
- (B) Linear momentum
- (C) Work
- (D) Angular momentum

Correct Answer: **(D)**

Level: **Easy**

Tagging:

Q135. Position of a body with acceleration a is given by $x = ka^m t^n$. Here t is time. Find the dimensions of m and n .

- (A) $m=1, n=1$
- (B) $m=1, n=2$
- (C) $m=2, n=1$
- (D) $m=2, n=2$

Correct Answer: **(B)**

Level: **Easy**

Tagging:

Q136. Pressure gradient has the same dimension as that of

- (A) Velocity gradient
- (B) Potential gradient
- (C) Energy gradient
- (D) None of these

Correct Answer: **(D)**

Level: **Easy**

Tagging:

Q137. R and L represent respectively resistance and self inductance, which of the following combinations has the dimensions of frequency

- (A) R/L
- (B) L/R
- (C) $\sqrt{R/L}$
- (D) $\sqrt{L/R}$

Correct Answer: **(A)**

Level: **Easy**

Tagging:

Q138. Resistance of a given wire is obtained by measuring the current flowing in it and the voltage difference applied across it. If the percentage errors in the measurement of the current and the voltage difference are 3% each, then error in the value of resistance is

- (A) 6%
- (B) Zero
- (C) 1%
- (D) 3%

Correct Answer: **(A)**

Level: **Easy**

Tagging:

Q139. Select the pair whose dimensions are same

- (A) Pressure and stress
- (B) Stress and strain
- (C) Pressure and force
- (D) Power and force

Correct Answer: **(A)**

Level: **Easy**

Tagging:

Q140. SI unit of electric intensity is

- (A) Coulomb
- (B) Coulomb/m²
- (C) Newton
- (D) Newton/ coulomb

Correct Answer: **(D)**

Level: **Easy**

Tagging:

Q141. SI unit of intensity of wave is

- (A) Jm⁻² s⁻¹
- (B) Jm⁻¹ s⁻²
- (C) W m⁻²
- (D) J m⁻²

Correct Answer: **(C)**

Level: **Easy**

Tagging:

Q142. SI unit of permittivity is

- (A) C² m² N²
- (B) C² m⁻² N⁻¹
- (C) C² m² N⁻¹
- (D) C⁻¹ m² N⁻²

Correct Answer: **(B)**

Level: **Easy**

Tagging:

Q143. Solar constant is defined as energy received by earth per cm² per minute. The dimensions of solar constant are

- (A) [ML² T⁻³]
- (B) [M² L⁰ T⁻¹]
- (C) [ML⁰ T⁻³]
- (D) [MLT⁻²]

Correct Answer: **(C)**

Level: **Easy**

Tagging:

Q144. Students I, II and III perform an experiment for measuring the acceleration due to gravity (g) using a simple pendulum. They use different lengths of the pendulum and/or record time for different number of oscillations. The observations are shown in the table

- (A) E_I=0
- (B) E_I is minimum
- (C) E_I=E_{II}
- (D) E_{II} is maximum

Correct Answer: **(B)**

Level: **Easy**

Tagging:

Q145. Temperature can be expressed as a derived quantity in terms of any of the following

- (A) Length and mass
- (B) Mass and time
- (C) Length, mass and time
- (D) None of these

Correct Answer: **(D)**

Level: **Easy**

Tagging:

Q146. The unit of absolute permittivity is

- (A) Fm (farad-metre)
- (B) Fm^{-1} (farad/metre)
- (C) Fm^{-2} (farad/metre²)
- (D) F (farad)

Correct Answer: **(B)**

Level: **Easy**

Tagging:

Q147. The air bubble formed by explosion inside water performed oscillation with time period T that is directly proportional to $p^a d^b E^c$, where p is the pressure, d is the density and E is the energy due to explosion. The values

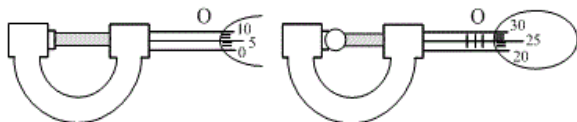
- (A) $-5/6, 1/2, 1/3$
- (B) $5/6, 1/3, 1/2$
- (C) $5/6, 1/2, 1/3$
- (D) None of these

Correct Answer: **(A)**

Level: **Easy**

Tagging:

Q148. The circular divisions of shown screw gauge are 50. It moves 0.5 mm on main scale in one rotation. The diameter of the ball is



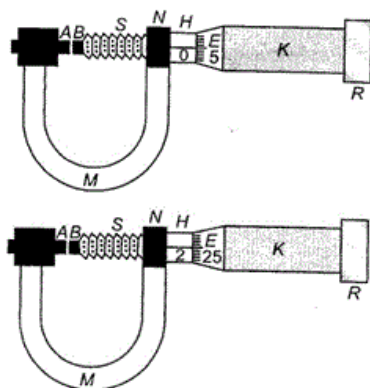
- (A) 2.25 mm
- (B) 2.20 mm
- (C) 1.20 mm
- (D) 1.25 mm

Correct Answer: **(C)**

Level: **Easy**

Tagging:

Q149. The circular scale of a screw gauge has 50 divisions and pitch of 0.5 mm. Find the diameter of sphere. Main scale reading is 2.



- (A) 1.2
- (B) 1.25
- (C) 2.2
- (D) 2.25

Correct Answer: **(A)**

Level: **Easy**

Tagging:

Q150. The constant of proportionality $1/(4\pi\epsilon_0)$ in Coulomb's law has the following dimensions

- (A) $C^{-2} Nm^2$
- (B) $C^2 N^{-1} m^{-2}$
- (C) $C^2 Nm^2$
- (D) $C^{-2} N^{-1} m^{-2}$

Correct Answer: **(A)**

Level: **Easy**

Tagging:

Q151. The correct value of $0^\circ C$ on the Kelvin scale is

- (A) 273.15 K
- (B) 272.85 K
- (C) 273 K
- (D) 273.2 K

Correct Answer: **(A)**

Level: **Easy**

Tagging:

Q152. The damping force on an oscillator is directly proportional to the velocity. The units of the constant of proportionality are

- (A) $kgms^{-1}$
- (B) $kgms^{-2}$
- (C) kgs^{-1}
- (D) kgs

Correct Answer: **(C)**

Level: **Easy**

Tagging:

Q153. The density of a solid ball is to be determined in an experiment. The diameter of the ball is measured with a screw gauge, whose pitch is 0.5 mm and there are 50 divisions on the circular scale. The reading on the main scale is 2.5 mm and that on the circular scale is 20 divisions. If the measured mass of the ball has a relative error of 2%, then the relative percentage error in the density is:-

- (A) 0.90%
- (B) 2.40%
- (C) 3.10%
- (D) 4.20%

Correct Answer: **(C)**

Level: **Easy**

Tagging:

Q154. The difference in the lengths of a mean solar day and a sidereal day is about

- (A) 1 min
- (B) 4 min
- (C) 15 min
- (D) 56 min

Correct Answer: **(B)**

Level: **Easy**

Tagging:

Q155. The dimension of $1/2 \epsilon_0 E^2$, where ϵ_0 is permittivity of free space and E is electric field, is

- (A) MLT^{-1}
- (B) $ML^2 T^{-2}$
- (C) $ML^{-1} T^{-2}$
- (D) $ML^2 T^{-1}$

Correct Answer: **(C)**

Level: **Easy**

Tagging:

Q156. The dimension of k in the equation $W=1/2 kx^2$ is

- (A) $[ML^0 T^{-2}]$
- (B) $[M^0 LT^{-1}]$
- (C) $[MLT^{-2}]$

(D) $[ML^0 T^{-1}]$

Correct Answer: **(A)**

Level: **Easy**

Tagging:

Q157. The dimensional formula for areal velocity is

(A) $[M^0 L^{-2} T]$

(B) $[M^0 L^{-2} T^{-1}]$

(C) $[M^0 L^2 T^{-1}]$

(D) $[M^0 L^2 T]$

Correct Answer: **(C)**

Level: **Easy**

Tagging:

Q158. The dimensional formula for Boltzmann's constant is

(A) $[ML^2 T^{-2} \theta^{-1}]$

(B) $[ML^2 T^{-2}]$

(C) $[ML^0 T^{-2} \theta^{-1}]$

(D) $[ML^{-2} T^{-1} \theta^{-1}]$

Correct Answer: **(A)**

Level: **Easy**

Tagging:

Q159. The dimensional formula for impulse is

(A) $[MLT^{-1}]$

(B) $[ML^{-1} T]$

(C) $[M^{-1} LT^{-1}]$

(D) $[ML^{-1} T^{-1}]$

Correct Answer: **(A)**

Level: **Easy**

Tagging:

Q160. The dimensional formula for impulse is same as the dimensional formula for

(A) Momentum

(B) Force

(C) Rate of change of momentum

(D) Torque

Correct Answer: **(A)**

Level: **Easy**

Tagging:

Q161. The dimensional formula for Planck's constant (h) is

(A) $ML^{-2} T^{-3}$

(B) $ML^2 T^{-2}$

(C) $ML^2 T^{-1}$

(D) $ML^{-2} T^{-2}$

Correct Answer: **(C)**

Level: **Easy**

Tagging:

Q162. The dimensional formula for the magnetic field is

(A) $[MT^{-2} A^{-1}]$

(B) $[ML^2 T^{-1} A^{-2}]$

(C) $[MT^{-2} A^{-2}]$

(D) $[MT^{-1} A^{-2}]$

Correct Answer: **(A)**

Level: **Easy**

Tagging:

Q163. The dimensional formula for the modulus of rigidity is

(A) $ML^2 T^{-2}$

(B) $ML^{-1} T^{-3}$

(C) $ML^{-2} T^{-2}$

(D) $ML^{-1} T^{-2}$

Correct Answer: **(D)**

Level: **Easy**

Tagging:

Q164. The dimensional formula for r.m.s. (root mean square) velocity is

(A) $M^0 L T^{-1}$

(B) $M^0 L^0 T^{-2}$

(C) $M^0 L^0 T^{-1}$

(D) MLT^{-3}

Correct Answer: **(A)**

Level: **Easy**

Tagging:

Q165. The dimensional formula of angular velocity is

(A) $M^0 L^0 T^{-1}$

(B) MLT^{-1}

(C) $M^0 L^0 T^1$

(D) $ML^0 T^{-2}$

Correct Answer: **(A)**

Level: **Easy**

Tagging:

Q166. The dimensional formula of magnetic flux is

(A) $[MLT^{-2} A^{-1}]$

(B) $[ML^2 T^{-1} A^{-1}]$

(C) $[ML^2 T^{-1} A^{-2}]$

(D) $[ML^2 T^{-2} A^{-1}]$

Correct Answer: **(D)**

Level: **Easy**

Tagging:

Q167. The dimensional formula of magnetic induction B is

(A) $[M^0 ALT^0]$

(B) $[M^0 AL^{-1} T^0]$

(C) $[M^0 AL^2 T^0]$

(D) $[ML^2 T^{-2} A^{-1}]$

Correct Answer: **(D)**

Level: **Easy**

Tagging:

Q168. The dimensional formula of the ratio of angular to linear momentum is

(A) $[M^0 LT^0]$

(B) $[MLT]$

(C) $[ML^2 T^{-1}]$

(D) $[M^{-1} L^{-1} T^{-1}]$

Correct Answer: **(A)**

Level: **Easy**

Tagging:

Q169. The dimensional formula of universal gas constant is

(A) $[ML^2 T^{-2} \theta^{-1}]$

(B) $[M^2 LT^{-2} \theta]$

(C) $[ML^3 T^{-1} \theta^{-1}]$

(D) None of these

Correct Answer: **(A)**

Level: **Easy**

Tagging:

Q170. The dimensions of $\frac{1}{2} \epsilon_0 E^2$ (ϵ_0 : permittivity of free space; E: electric field) is

(A) $[MLT]$

(B) $[ML^2 T^{-2}]$

(C) $[ML^{-1}T^{-2}]$

(D) $[ML^2 T^{-1}]$

Correct Answer: **(C)**

Level: **Easy**

Tagging: **Remembering**

Q171. The dimensions of $1/2\epsilon E^2$ are same as

(A) Energy density (energy per unit volume)

(B) Energy

(C) Power

(D) None of the above

Correct Answer: **(A)**

Level: **Easy**

Tagging:

Q172. The dimensions of a rectangular block measured with calipers having least count of 0.01 cm are 5 mm \times 10 mm \times 5 mm. The maximum percentage error in the measurement of the volume of the block is

(A) 5%

(B) 10%

(C) 15%

(D) 20%

Correct Answer: **(A)**

Level: **Easy**

Tagging:

Q173. The dimensions of a/b in the equation $p=(a - t^2)/bx$ where p is pressure, x is distance and t is time, are

(A) $[M^2 LT^{-3}]$

(B) $[MT^{-2}]$

(C) $[LT^{-3}]$

(D) $[ML^3 T^{-1}]$

Correct Answer: **(B)**

Level: **Easy**

Tagging:

Q174. The dimensions of coefficient of thermal conductivity is

(A) $ML^2 T^{-2} K^{-1}$

(B) $MLT^{-3} K^{-1}$

(C) $MLT^{-2} K^{-1}$

(D) $MLT^{-3} K$

Correct Answer: **(B)**

Level: **Easy**

Tagging:

Q175. The dimensions of couple are

(A) $ML^2 T^{-2}$

(B) MLT^{-2}

(C) $ML^{-1} T^{-3}$

(D) $ML^{-2} T^{-2}$

Correct Answer: **(A)**

Level: **Easy**

Tagging:

Q176. The dimensions of CV^2 matches with the dimensions of

(A) $L^2 I$

(B) $L^2 I^2$

(C) LI^2

(D) $1/(LI)$

Correct Answer: **(C)**

Level: **Easy**

Tagging:

Q177. The dimensions of $e^{2/4}\pi\epsilon_0 hc$, where e, ϵ_0, h and c are electronic charge, electric permittivity, Planck's constant and velocity of light in vacuum respectively

- (A) $[M^0 L^0 T^0]$
- (B) $[M^1 L^0 T^0]$
- (C) $[M^0 L^1 T^0]$
- (D) $[M^0 L^0 T^1]$

Correct Answer: **(A)**

Level: **Easy**

Tagging:

Q178. The dimensions of electric potential are

- (A) $[ML^2 T^{-2} Q^{-1}]$
- (B) $[MLT^{-2} Q^{-1}]$
- (C) $[ML^2 T^{-1} Q]$
- (D) $[ML^2 T^{-2} Q]$

Correct Answer: **(A)**

Level: **Easy**

Tagging:

Q179. The dimensions of emf in MKS is

- (A) $[ML^{-1} T^{-2} Q^{-2}]$
- (B) $[ML^{-2} T^{-2} Q^{-2}]$
- (C) $[MLT^{-2} Q^{-1}]$
- (D) $[ML^2 T^{-2} Q^{-1}]$

Correct Answer: **(D)**

Level: **Easy**

Tagging:

Q180. The dimensions of gravitational constant G and the moment of inertia are respectively

- (A) $[ML^3 T^{-2}]; [ML^2 T^0]$
- (B) $[M^{-1} L^3 T^{-2}]; [ML^2 T^0]$
- (C) $[M^{-1} L^3 T^{-2}]; [M^{-1} L^2 T]$
- (D) $[ML^3 T^{-2}]; [M^{-1} L^2 T]$

Correct Answer: **(B)**

Level: **Easy**

Tagging:

Q181. The dimensions of inter atomic force constant are

- (A) MT^{-2}
- (B) MLT^{-1}
- (C) MLT^{-2}
- (D) $ML^{-1} T^{-1}$

Correct Answer: **(A)**

Level: **Easy**

Tagging:

Q182. The dimensions of K in the equation $W = \frac{1}{2} Kx^2$ is

- (A) $M^1 L^0 T^{-2}$
- (B) $M^0 L^1 T^{-1}$
- (C) $M^1 L^1 T^{-2}$
- (D) $M^1 L^0 T^{-1}$

Correct Answer: **(A)**

Level: **Easy**

Tagging:

Q183. The dimensions of kinetic energy are

- (A) $[M^2 L^2 T]$
- (B) $[ML^2 T]$

(C) $[ML^2 T^{-2}]$

(D) $[ML^2 T^{-1}]$

Correct Answer: **(C)**

Level: **Easy**

Tagging:

Q184. The dimensions of permittivity ϵ_0 are

(A) $A^2 T^2 M^{-1} L^{-3}$

(B) $A^2 T^4 M^{-1} L^{-3}$

(C) $A^{-2} T^{-4} ML^3$

(D) $A^2 T^{-4} M^{-1} L^{-3}$

Correct Answer: **(B)**

Level: **Easy**

Tagging:

Q185. The dimensions of physical quantity X in the equation

Force = X/(Density) is given by

(A) $M^1 L^4 T^{-2}$

(B) $M^2 L^{-2} T^{-1}$

(C) $M^2 L^{-2} T^{-2}$

(D) $M^1 L^{-2} T^{-1}$

Correct Answer: **(C)**

Level: **Easy**

Tagging:

Q186. The dimensions of Planck's constant are

(A) $[M^2 L^2 T^{-2}]$

(B) $[MLT^{-2}]$

(C) $[ML^2 T^{-2}]$

(D) $[ML^2 T^{-1}]$

Correct Answer: **(D)**

Level: **Easy**

Tagging:

Q187. The dimensions of Planck's constant is same as that of

(A) Angular momentum

(B) Linear momentum

(C) Work

(D) Coefficient of viscosity

Correct Answer: **(A)**

Level: **Easy**

Tagging:

Q188. The dimensions of potential are the same as that of

(A) Work

(B) Electric field per unit charge

(C) Work per unit charge

(D) Force per unit charge

Correct Answer: **(C)**

Level: **Easy**

Tagging:

Q189. The dimensions of pressure is equal to

(A) Force per unit volume

(B) Energy per unit volume

(C) Force

(D) energy

Correct Answer: **(B)**

Level: **Easy**

Tagging:

Q190. The dimensions of resistivity in terms of M,L,T and Q where Q stands for the dimensions of charge, is

(A) $ML^3 T^{-1} Q^{-2}$

(B) $ML^3 T^{-2} Q^{-1}$

(C) $ML^2 T^{-1} Q^{-1}$

(D) $MLT^{-1} Q^{-1}$

Correct Answer: **(A)**

Level: **Easy**

Tagging:

Q191. The dimensions of stress are equal to

(A) Force

(B) Pressure

(C) Work

(D) 1/Pressure

Correct Answer: **(B)**

Level: **Easy**

Tagging:

Q192. The dimensions of time constant are

(A) $[M^0 L^0 T^0]$

(B) $[M^0 L^0 T]$

(C) $[MLT]$

(D) None of these

Correct Answer: **(B)**

Level: **Easy**

Tagging:

Q193. The dimensions of universal gas constant is

(A) $[ML^2 T^{-2} \theta^{-1}]$

(B) $[M^2 LT^{-2} \theta]$

(C) $[ML^3 T^{-1} \theta^{-1}]$

(D) None of these

Correct Answer: **(A)**

Level: **Easy**

Tagging:

Q194. The energy (E), angular momentum (L) and universal gravitational constant (G) are chosen as fundamental quantities. The dimensions of universal gravitational constant in the dimensional formula of Planck's constant (h) is

(A) Zero

(B) -1

(C) 05-Mar

(D) 1

Correct Answer: **(A)**

Level: **Easy**

Tagging:

Q195. The equation $(P+a/V^2) \cdot (V - b) = \text{constant}$. The unit of a is

(A) Dyne \times cm⁵

(B) Dyne \times cm⁴

(C) Dyne \times cm³

(D) Dyne \times cm²

Correct Answer: **(B)**

Level: **Easy**

Tagging:

Q196. The equation of state of some gases can be expressed as $(P+a/V^2) = R\theta/V$. Where P is the pressure, V the volume, θ the absolute temperature and a and b are constants. The dimensional formula of a is

(A) $[ML^5 T^{-2}]$

(B) $[M^{-1} L^5 T^{-2}]$

(C) $[ML^{-1} T^{-2}]$

(D) $[ML^{-5} T^{-2}]$

Correct Answer: **(A)**

Level: **Easy**

Tagging:

Q197. The expression for centripetal force depends upon mass of body, speed of the body and the radius of circular path. Find the expression for centripetal force

- (A) $F=(mv^2)/(2r^3)$
- (B) $F=(mv^2)/r$
- (C) $F=(mv^2)/r^2$
- (D) $F=(m^2 v^2)/2r$

Correct Answer: **(B)**

Level: **Easy**

Tagging:

Q198. The focal length of a mirror is given by $1/f=1/u+(1/v)$ where u and v represent object and image distances respectively. The maximum relative error in f is

- (A) $\Delta f/f=\Delta u/u+\Delta v/v$
- (B) $\Delta f/f=1/(\Delta u/u)+1/(\Delta v/v)$
- (C) $\Delta f/f=\Delta u/u+\Delta v/v-\Delta(u+v)/(u+v)$
- (D) $\Delta f/f=\Delta u/u+\Delta v/v+\Delta u/(u+v)+\Delta v/(u+v)$

Correct Answer: **(D)**

Level: **Easy**

Tagging:

Q199. The following observations were taken for determining surface tension of water by capillary tube method. Diameter of capillary, $D=1.25\times 10^{-2}$ m and rise of water in capillary, $h=1.46\times 10^{-2}$ m

Taking $g=9.80\text{ms}^{-2}$ and using the r

- (A) 2.40%
- (B) 15%
- (C) 1.60%
- (D) 0.15%

Correct Answer: **(C)**

Level: **Easy**

Tagging:

Q200. The force F on the sphere of radius ' a ' moving in a medium with velocity ' u ' is given by $F=6\pi\eta au$. The dimensions of η are

- (A) $\text{ML}^{-1}\text{T}^{-1}$
- (B) MT^{-1}
- (C) MLT^{-2}
- (D) ML^{-3}

Correct Answer: **(A)**

Level: **Easy**

Tagging:

Q201. The frequency of vibration of string is given by $v=P/2l [F/m]^{1/2}$. Here p is number of segments in the string and l is the length. The dimensional formula for m will be

- (A) $[M^0\text{LT}^{-1}]$
- (B) $[ML^0\text{T}^{-1}]$
- (C) $[ML^{-1}\text{T}^0]$
- (D) $[M^0\text{L}^0\text{T}^0]$

Correct Answer: **(C)**

Level: **Easy**

Tagging:

Q202. The least count of a stop watch is 0.2 s. The time of 20 oscillations of a pendulum is measured to be 25 s. The percentage error in the measurement of time will be

- (A) 8%
- (B) 1.80%
- (C) 0.80%
- (D) 0.10%

Correct Answer: **(C)**

Level: **Easy**

Tagging:

Q203. The length l , breadth b and thickness t of a block are measured with the help of a metre scale. Given $l=15.12\pm 0.01\text{cm}$, $b=10.15\pm 0.01\text{cm}$, $t=5.28\pm 0.01\text{cm}$.

The percentage error in volume is

- (A) 0.64%
- (B) 0.28%
- (C) 0.37%
- (D) 0.48%

Correct Answer: **(C)**

Level: **Easy**

Tagging:

Q204. The length of a cube is 2.1×10^{-2} m. the volume in significant figures will be

- (A) $9.2 \times 10^{-6} \text{ m}^3$
- (B) $9.3 \times 10^{-6} \text{ m}^3$
- (C) $9.26 \times 10^{-6} \text{ m}^3$
- (D) $9.261 \times 10^{-6} \text{ m}^3$

Correct Answer: **(B)**

Level: **Easy**

Tagging:

Q205. The length of a cylinder is measured with a meter rod having least count 0.1 cm.

Its diameter is measured with vernier callipers having least count 0.01 cm. Given that length is 5.0 cm. and radius is 2.0 cm. The percentage error in the calculated value of the volume will be

- (A) 1%
- (B) 2%
- (C) 3%
- (D) 4%

Correct Answer: **(C)**

Level: **Easy**

Tagging:

Q206. The length of a simple pendulum is about 100 cm known to an accuracy of 1 mm. Its period of oscillation is 2 s determined by measuring the time for 100 oscillations using a clock of 0.1 s resolution. What is the accuracy in the determined value of g?

- (A) 0.20%
- (B) 0.50%
- (C) 0.10%
- (D) 2%

Correct Answer: **(A)**

Level: **Easy**

Tagging:

Q207. The length, breadth and thickness of a block are given by $l=12$ cm, $b=6$ cm and $t=2.45$ cm

The volume of block according to the idea of significant figures should be

- (A) $1 \times 10^2 \text{ cm}^3$
- (B) $2 \times 10^2 \text{ cm}^3$
- (C) $1.763 \times 10^2 \text{ cm}^3$
- (D) None of these

Correct Answer: **(B)**

Level: **Easy**

Tagging:

Q208. The length, breadth and thickness of a metal block is given by $l=90$ cm, $b=8$ cm, $t=2.45$ cm. The volume of the block is

- (A) $2 \times 10^2 \text{ cm}^3$
- (B) $1.8 \times 10^2 \text{ cm}^3$
- (C) $1.77 \times 10^2 \text{ cm}^3$
- (D) $1.764 \times 10^2 \text{ cm}^3$

Correct Answer: **(A)**

Level: **Easy**

Tagging:

Q209. The mass and volume of a body are found to be 500 ± 0.05 kg and $1.00 \pm 0.05 \text{ m}^3$ respectively. Then the maximum possible percentage error in its density is

- (A) 6%
- (B) 3%

(C) 10%

(D) 5%

Correct Answer: **(A)**

Level: **Easy**

Tagging:

Q210. The mass of a box is 2.3 g. Two gold pieces, each of mass 0.035 g, are placed in it. The total mass of the box and gold pieces is

(A) 2.3 g

(B) 2.4 g

(C) 2.37 g

(D) 2.370 g

Correct Answer: **(B)**

Level: **Easy**

Tagging:

Q211. The mean time period of second's pendulum is 2.00s and mean absolute error in the time period is 0.05s. To express maximum estimate of error, the time period should be written as

(A) $(2.00 \pm 0.01)s$

(B) $(2.00 + 0.025)s$

(C) $(2.00 \pm 0.05) s$

(D) $(2.00 \pm 0.10) s$

Correct Answer: **(C)**

Level: **Easy**

Tagging:

Q212. The measured mass and volume of a body are 23.42 g and 4.9 cm^3 respectively with possible error 0.01 g and 0.1 cm^3 . The maximum error in density is nearly

(A) 0.20%

(B) 2%

(C) 5%

(D) 10%

Correct Answer: **(B)**

Level: **Easy**

Tagging:

Q213. The number of particles given by $n = -D (n_2 - n_1) / (x_2 - x_1)$ are crossing a unit area perpendicular to x-axis in unit time, where n_1 and n_2 are the number of particles per unit volume for the val

(A) $[M^0 L T^0]$

(B) $[M^0 L^2 T^{-4}]$

(C) $[M^0 L T^{-3}]$

(D) $[M^0 L^2 T^{-1}]$

Correct Answer: **(D)**

Level: **Easy**

Tagging:

Q214. The number of significant figures in all the given numbers 25.12, 2009, 4.156 and 1.217×10^{-4} is

(A) 1

(B) 2

(C) 3

(D) 4

Correct Answer: **(D)**

Level: **Easy**

Tagging:

Q215. The percentage error in the above problem is

(A) 7%

(B) 5.95%

(C) 8.95%

(D) 9.85%

Correct Answer: **(C)**

Level: **Easy**

Tagging:

Q216. The percentage errors in the measurement of a mass and speed are 2% and 3% respectively. How much will be the maximum error in the estimate of kinetic energy obtained by measuring mass and speed?

- (A) 11%
- (B) 8%
- (C) 5%
- (D) 1%

Correct Answer: **(B)**

Level: **Easy**

Tagging:

Q217. The percentage errors in the measurement of length and time period of a simple pendulum are 1% and 2% respectively. Then the maximum error in the measurement of acceleration due to gravity is

- (A) 8%
- (B) 3%
- (C) 4%
- (D) 5%

Correct Answer: **(D)**

Level: **Easy**

Tagging:

Q218. The period of oscillation of a simple pendulum in the experiment is recorded as 2.63 s, 2.56 s, 2.42 s, 2.71 s and 2.80 s respectively. The average absolute error is

- (A) 0.1 s
- (B) 0.11 s
- (C) 0.01 s
- (D) 1.0 s

Correct Answer: **(B)**

Level: **Easy**

Tagging:

Q219. The period of oscillation of a simple pendulum is given by $T=2\pi\sqrt{l/g}$ where l is about 100 cm and is known to have 1mm accuracy. The period is about 2s. The time of 100 oscillations is measured by a stop watch of least count 0.1 s . The percentage error is

- (A) 0.10%
- (B) 1%
- (C) 0.20%
- (D) 0.80%

Correct Answer: **(C)**

Level: **Easy**

Tagging:

Q220. The physical quantity angular momentum has the same dimensions as that of

- (A) Work
- (B) Force
- (C) Momentum
- (D) Planck's constant

Correct Answer: **(D)**

Level: **Easy**

Tagging:

Q221. The physical quantity having the dimensions $[M^{-1} L^{-3} A^2]$ is

- (A) Resistance
- (B) Resistivity
- (C) Electrical conductivity
- (D) Electromotive force

Correct Answer: **(C)**

Level: **Easy**

Tagging:

Q222. The physical quantity having the dimensions $[M^{-1} L^{-3} T^3 A^2]$ is

- (A) Resistance
- (B) Resistivity
- (C) Electrical conductivity
- (D) Electromotive force

Correct Answer: **(C)**

Level: **Easy**

Tagging:

Q223. The physical quantity that has no dimensions is

- (A) Angular Velocity
- (B) Linear momentum
- (C) Angular momentum
- (D) Strain

Correct Answer: **(D)**

Level: **Easy**

Tagging:

Q224. The physical quantity which has dimensional formula as that of Energy/(Mass×Length) is

- (A) Force
- (B) Power
- (C) Pressure
- (D) Acceleration

Correct Answer: **(D)**

Level: **Easy**

Tagging:

Q225. The physical quantity which has the dimensional formula $[M^1 T^{-3}]$ is

- (A) Surface tension
- (B) Density
- (C) Solar constant
- (D) Compressibility

Correct Answer: **(C)**

Level: **Easy**

Tagging:

Q226. The physical quantity which has the dimensional formula $M^1 T^{-3}$ is

- (A) Surface tension
- (B) Solar constant
- (C) Density
- (D) Compressibility

Correct Answer: **(B)**

Level: **Easy**

Tagging:

Q227. The position of a particle at time t is given by the equation $x(t) = v_0/A (1 - e^{-At})$, $v_0 = \text{constant}$ and $A > 0$. Dimensions of v_0 and A respectively are

- (A) $[M^0 L T^0]$ and $[M^0 L^0 T^{-1}]$
- (B) $[M^0 L T^{-1}]$ and $[M^0 L T^{-2}]$
- (C) $[M^0 L T^{-1}]$ and $[M^0 L^0 T]$
- (D) $[M^0 L T^{-1}]$ and $[M^0 L^0 T^{-1}]$

Correct Answer: **(D)**

Level: **Easy**

Tagging:

Q228. The potential energy of a particle varies with distance x from a fixed origin as $U = ((A\sqrt{x})/(x+B))$; where A and B are constants. The dimensions of AB are

- (A) $[ML^{5/2} T^{-2}]$
- (B) $[ML^2 T^{-2}]$
- (C) $[M^{3/2} L^{3/2} T^{-2}]$
- (D) $[ML^{7/2} T^{-2}]$

Correct Answer: **(D)**

Level: **Easy**

Tagging:

Q229. The power of lens is $P = 1/f$, where f is focal length of the lens . The dimensions of power of lens are

- (A) $[LT^{-2}]$
- (B) $[M^0 L^{-1} T^0]$
- (C) $[M^0 L^0 T^0]$
- (D) None of these

Correct Answer: **(B)**

Level: **Easy**

Tagging:

Q230. The pressure on a square plate is measured by measuring the force on the plate and the length of the sides of the plate by using the formula $p = F/l^2$. If the maximum errors in the measurement of force and length are 4% and 2% respectively, then

- (A) 1%
- (B) 2%
- (C) 8%
- (D) 10%

Correct Answer: **(C)**

Level: **Easy**

Tagging:

Q231. The pressure on a square plate is measured by measuring the force on the plate and the length of the sides of the plate. If the maximum error in the measurement of force and length are respectively 4% and 2%, the maximum error in the measurement of pressure is

- (A) 1%
- (B) 2%
- (C) 6%
- (D) 8%

Correct Answer: **(D)**

Level: **Easy**

Tagging:

Q232. The radius of a wire is 0.24 mm. Then its area of cross section by taking significant figures into consideration is

- (A) 0.1 mm²
- (B) 0.2 mm²
- (C) 0.18 mm²
- (D) 0.180 mm²

Correct Answer: **(C)**

Level: **Easy**

Tagging:

Q233. The radius of the proton is about 10^{-15} m. The radius of the observable universe is 10^{26} m. identify the distance which is half-way between these two extremes on a logarithmic scale.

- (A) 10^{21} m
- (B) 10^6 m
- (C) 10^{-6} m
- (D) 10^0 m

Correct Answer: **(B)**

Level: **Easy**

Tagging:

Q234. The radius of the sphere is (4.3 ± 0.1) cm. The percentage error in its volume is

- (A) $0.1/4.3 \times 100$
- (B) $3 \times (0.1 \times 100)/4.3$
- (C) $1/3 \times (0.1 \times 100)/4.3$
- (D) $3 + (0.1 \times 100)/4.3$

Correct Answer: **(B)**

Level: **Easy**

Tagging:

Q235. The random error in the arithmetic mean of 100 observations is x ; then random error in the arithmetic mean of 400 observations would be

- (A) $4x$
- (B) $1/4 x$
- (C) $2x$
- (D) $1/2 x$

Correct Answer: **(B)**

Level: **Easy**

Tagging:

Q236. The ratio of 1 kWh to 1 MeV is

- (A) 2.25×10^{17}
- (B) 2.25×10^{19}
- (C) 2.25×10^{23}

(D) $2.25 \times 4.4 \times 10^9$

Correct Answer: **(B)**

Level: **Easy**

Tagging:

Q237. The ratio of the dimension of Planck's constant and that of moment of inertia is the dimension of

- (A) Frequency
- (B) Velocity
- (C) Angular momentum
- (D) Time

Correct Answer: **(A)**

Level: **Easy**

Tagging:

Q238. The relative density of material of a body is found by weighing it first in air and then in water. If the weight in air is (5.00 ± 0.05) newton and weight in water is (4.00 ± 0.05) newton. Then the relative density along with the maximum permissible percentage

- (A) $5.0 \pm 11\%$
- (B) $5.0 \pm 1\%$
- (C) $5.0 \pm 6\%$
- (D) $1.25 \pm 5\%$

Correct Answer: **(A)**

Level: **Easy**

Tagging:

Q239. The relative density of the material of a body is the ratio of its weight in air and the loss of its weight in water. By using a spring balance, the weight of the body in air is measured to be $5.00 \pm 0.05\text{N}$. The weight of the body in water is measured to be

- (A) 11%
- (B) 10%
- (C) 9%
- (D) 7%

Correct Answer: **(A)**

Level: **Easy**

Tagging:

Q240. The resistance $R = V/i$ where $V = 100 \pm 5$ volts and $i = 10 \pm 0.2$ amperes. What is the total error in R

- (A) 5%
- (B) 7%
- (C) 5.20%
- (D) $5/2\%$

Correct Answer: **(B)**

Level: **Easy**

Tagging:

Q241. The S.I. unit of gravitational potential is

- (A) J
- (B) $\text{J} \cdot \text{kg}^{-1}$
- (C) $\text{J} \cdot \text{kg}$
- (D) $\text{J} \cdot \text{kg}^{-2}$

Correct Answer: **(C)**

Level: **Easy**

Tagging:

Q242. The SI unit of electrochemical equivalent is

- (A) Kg C
- (B) C kg^{-1}
- (C) Kg C^{-1}
- (D) $\text{kg}^2 \text{C}^{-1}$

Correct Answer: **(C)**

Level: **Easy**

Tagging:

Q243. The SI unit of length is the metre. Suppose we adopt a new unit of length which equals x metre. The area of 1 m^2 expressed in terms of the new unit has a magnitude

- (A) x
- (B) x^2

(C) x^{-1}

(D) x^{-2}

Correct Answer: **(D)**

Level: **Easy**

Tagging:

Q244. The speed (v) of ripples on the surface of water depends on surface tension (σ), density (ρ) and wavelength (λ). The square of speed (v) is proportional to

(A) $\sigma/\rho\lambda$

(B) $\rho/\sigma\lambda$

(C) $\lambda/\sigma\rho$

(D) $\rho\lambda\sigma$

Correct Answer: **(A)**

Level: **Easy**

Tagging:

Q245. The surface tension of a liquid is 70 dyne/cm, in MKS system value is

(A) 70 N/m

(B) 7×10^{-2} N/m

(C) 7×10^3 N/m

(D) 7×10^2 N/m

Correct Answer: **(B)**

Level: **Easy**

Tagging:

Q246. The temperature of a body on Kelvin scale is found to be X K. When it is measured by a Fahrenheit thermometer, it is found to be X^0 F. Then X is

(A) 301.25

(B) 574.25

(C) 313

(D) 40

Correct Answer: **(B)**

Level: **Easy**

Tagging:

Q247. The unit of e.m.f. is

(A) Joule

(B) Joule-coulomb

(C) Volt-coulomb

(D) Joule/coulomb

Correct Answer: **(D)**

Level: **Easy**

Tagging:

Q248. The unit of L/R is (where L =inductance and R = Resistance)

(A) Sec

(B) Sec^{-1}

(C) Volt

(D) Ampere

Correct Answer: **(A)**

Level: **Easy**

Tagging:

Q249. The unit of magnetic moment is

(A) TJ^{-1}

(B) JT^{-1}

(C) Am^{-2}

(D) Am^{-1}

Correct Answer: **(B)**

Level: **Easy**

Tagging:

Q250. The unit of momentum is

(A) N s

- (B) Ns^{-1}
- (C) N m
- (D) N m^{-1}

Correct Answer: **(A)**

Level: **Easy**

Tagging:

Q251. The unit of nuclear dose given to a patient is

- (A) Fermi
- (B) Rutherford
- (C) Curie
- (D) Roentgen

Correct Answer: **(D)**

Level: **Easy**

Tagging:

Q252. The unit of percentage error is

- (A) Same as that of physical quantity
- (B) Different from that of physical quantity
- (C) Percentage error is unit less
- (D) Errors have got their own units which are different from that of physical quantity measured

Correct Answer: **(C)**

Level: **Easy**

Tagging:

Q253. The unit of permittivity of free space ϵ_0 is

- (A) Coulomb/newton-metre
- (B) $\text{Newton-metre}^2/\text{coulomb}^2$
- (C) $\text{Coulomb}^2/(\text{newton-metre})^2$
- (D) $\text{Coulomb}^2/\text{newton-metre}^2$

Correct Answer: **(D)**

Level: **Easy**

Tagging:

Q254. The unit of physical quantity obtained by the line intergral of electric field is

- (A) NC^{-1}
- (B) Vm^{-1}
- (C) JC^{-1}
- (D) $\text{C}^2 \text{N}^{-1} \text{m}^{-2}$

Correct Answer: **(C)**

Level: **Easy**

Tagging:

Q255. The unit of potential energy is

- (A) $\text{g}(\text{cm}/\text{sec}^2)$
- (B) $\text{g}(\text{cm}/\text{sec})^2$
- (C) $\text{g}(\text{cm}^2/\text{sec})$
- (D) $\text{g}(\text{cm}/\text{sec})$

Correct Answer: **(B)**

Level: **Easy**

Tagging:

Q256. The unit of reactance is

- (A) Ohm
- (B) Volt
- (C) Mho
- (D) Newton

Correct Answer: **(A)**

Level: **Easy**

Tagging:

Q257. The unit of reduction factor of tangent galvanometer is

- (A) Ampere
- (B) Gauss

- (C) Radian
- (D) None of these

Correct Answer: **(A)**

Level: **Easy**

Tagging:

Q258. The unit of self inductance of a coil is

- (A) Farad
- (B) Henry
- (C) Weber
- (D) Tesla

Correct Answer: **(B)**

Level: **Easy**

Tagging:

Q259. The unit of specific resistance is

- (A) Ohm/cm²
- (B) Ohm/cm
- (C) Ohm-cm
- (D) (Ohm-cm)⁻¹

Correct Answer: **(C)**

Level: **Easy**

Tagging:

Q260. The unit of Stefan's constant is

- (A) Wm⁻² K⁻¹
- (B) Wm K⁻⁴
- (C) Wm⁻² K⁻⁴
- (D) Nm⁻² K⁻⁴

Correct Answer: **(C)**

Level: **Easy**

Tagging:

Q261. The unit of surface tension in SI system is

- (A) Dyne/cm²
- (B) Newton /m
- (C) Dyne/cm
- (D) Newton/m²

Correct Answer: **(B)**

Level: **Easy**

Tagging:

Q262. The unit of the coefficient of viscosity in S.I. system is

- (A) m/kg-s
- (B) m-s/kg²
- (C) kg/m-s²
- (D) kg/m-s

Correct Answer: **(D)**

Level: **Easy**

Tagging:

Q263. The unit of Wien's constant b is

- (A) Wm⁻² K⁻⁴
- (B) m⁻¹ K⁻¹
- (C) Wm²
- (D) MK

Correct Answer: **(D)**

Level: **Easy**

Tagging:

Q264. The units of modulus rigidity are

- (A) N-m
- (B) N/m
- (C) N-m²

(D) N/m^2

Correct Answer: **(D)**

Level: **Easy**

Tagging:

Q265. The value of universal gas constant is $R=8.3 \text{ J/K-mol}$. The value of R in atmosphere litre per Kelvin mol

(A) 8.12

(B) 0.00812

(C) 81.2

(D) 0.0812

Correct Answer: **(D)**

Level: **Easy**

Tagging:

Q266. The values of two resistors are $R_1=(6 \pm 0.3)\text{k}\Omega$ and $R_2=(10 \pm 0.2)\text{k}\Omega$. The percentage error in the equivalent resistance when they are connected in parallel is

(A) 5.13%

(B) 2%

(C) 3.13%

(D) 10.13%

Correct Answer: **(D)**

Level: **Easy**

Tagging:

Q267. The velocity of a body is given by the equation $v=b/t+ct^2+dt^2$

The dimensional formula of b is

(A) $[M^0 L T^0]$

(B) $[ML^0 T^0]$

(C) $[M^0 L^0 T]$

(D) $[MLT^{-1}]$

Correct Answer: **(A)**

Level: **Easy**

Tagging:

Q268. The velocity of a freely falling body changes as $g^p h^q$ where g is acceleration due to gravity and h is the height. The values of p and q are

(A) $1, 1/2$

(B) $1/2, 1/2$

(C) $1/2, 1$

(D) $1, 1$

Correct Answer: **(B)**

Level: **Easy**

Tagging:

Q269. The velocity of a particle (v) at an instant t is given by $v=at+bt^2$ the dimension of b is

(A) L

(B) LT^{-1}

(C) LT^{-2}

(D) LT^{-3}

Correct Answer: **(D)**

Level: **Easy**

Tagging:

Q270. The velocity of transverse wave in a string is $v=\sqrt{T/m}$, where T is the tension in the string and m is mass per unit length. If $T=3.0 \text{ kgf}$, mass of string is 2.5 g and length of string is 1.00m , then the percentage error in the measurement of velocity is

(A) 0.5

(B) 0.7

(C) 2.3

(D) 3.6

Correct Answer: **(D)**

Level: **Easy**

Tagging:

Q271. The velocity of water waves u may depend upon their wavelength λ , the density of water ρ and the acceleration due to gravity g . The method of dimensions gives the relation between these quantities as

(A) $u^2 \propto \lambda g^{-1} \rho^{-1}$

(B) $u^2 \propto g \lambda \rho$

(C) $u^2 \propto g \lambda$

(D) $u^2 \propto g^{-1} \lambda^{-3}$

Correct Answer: **(C)**

Level: **Easy**

Tagging:

Q272. The velocity v (in cm/sec) of a particle is given in terms of time t (in sec) by the relation $v = at + b/(t+c)$; the dimensions of a, b and c are

(A) $a = L^2, b = T, c = LT^2$

(B) $a = LT^2, b = LT, c = L$

(C) $a = LT^2, b = L, c = T$

(D) $a = L, b = LT, c = T^2$

Correct Answer: **(C)**

Level: **Easy**

Tagging:

Q273. The velocity v of water waves may depend on their wavelength (λ), the density of water (ρ) and the acceleration due to gravity (g). The method of dimensions gives the relation between these quantities as

(A) $v^2 \propto \lambda^{-1} \rho^{-1}$

(B) $v^2 \propto g \lambda$

(C) $v^2 \propto g \lambda \rho$

(D) $g^{-1} \propto \lambda^3$

Correct Answer: **(B)**

Level: **Easy**

Tagging:

Q274. The wavelength associated with a moving particle depends upon power p of its mass m , q th power of its velocity v and r th power of Planck's constant h . Then the correct set of values of p, q and r is

(A) $p=1, q=-1, r=1$

(B) $p=1, q=1, r=1$

(C) $p=-1, q=-1, r=-1$

(D) $p=-1, q=-1, r=1$

Correct Answer: **(D)**

Level: **Easy**

Tagging:

Q275. The work done by a battery is $W = \epsilon \Delta q$, where Δq change transferred by battery, $\epsilon = \text{emf}$ of the battery. What are dimensions of emf of battery?

(A) $[M^0 L^0 T^{-2} A^{-2}]$

(B) $[ML^2 T^{-3} A^{-2}]$

(C) $[M^2 L^0 T^{-3} A^0]$

(D) $[ML^2 T^{-3} A^{-1}]$

Correct Answer: **(D)**

Level: **Easy**

Tagging:

Q276. There are atomic clocks capable of measuring time with an accuracy of 1 part in 10^{11} . If two such clocks are operated with precision, then after running for 5000 years, these will record

(A) A difference of nearly 1 s

(B) A difference of 1 day

(C) A difference of 10^{11} s

(D) A difference of 1 year

Correct Answer: **(A)**

Level: **Easy**

Tagging:

Q277. To determine the Young's modulus of a wire, the formula is $Y = F/A \times L/\Delta L$; where L = length, A = area of cross-section of the wire, ΔL = change in length of the wire when stretched with a force F . The conversion factor to change it from CGS to MKS system is

(A) 1

- (B) 10
- (C) 0.1
- (D) 0.01

Correct Answer: **(C)**

Level: **Easy**

Tagging:

Q278. Two full turns of the circular scale of a screw gauge cover a distance of 1 mm on its main scale. The total number of divisions on the circular scale is 50. Further, it is found that the screw gauge has a zero error of -0.03 mm. While measuring the diame

- (A) 3.73 mm
- (B) 3.67 mm
- (C) 3.38 mm
- (D) 3.32 mm

Correct Answer: **(C)**

Level: **Easy**

Tagging:

Q279. Two full turns of the circular scale of a screw gauge cover a distance of 1 mm on its main scale. The total number of divisions on the circular scale is 50. Further, it is found that the screw gauge has a zero error of -0.03 mm. While measuring the diameter of a thin wire, a student notes the main scale reading of 3 mm and the number of circular scale divisions in line with the main scale as 35. The diameter of the wire is:

- (A) 3.32 mm
- (B) 3.73 mm
- (C) 3.67 mm
- (D) 3.38 mm

Correct Answer: **(D)**

Level: **Easy**

Tagging:

Q280. Two wires of same dimensions but resistivities ρ_1 and ρ_2 are connected in series. The equivalent resistivity of the combination is

- (A) $\sqrt{(\rho_1 \rho_2)}$
- (B) $(\rho_1 + \rho_2)$
- (C) $(\rho_1 + \rho_2)/2$
- (D) None of these

Correct Answer: **(C)**

Level: **Easy**

Tagging: **Remembering**

Q281. Unit of stress is

- (A) N/m
- (B) N-m
- (C) N/m^2
- (D) N-m^2

Correct Answer: **(C)**

Level: **Easy**

Tagging:

Q282. Unit of electric flux is

- (A) Vm
- (B) Nm/C^{-1}
- (C) Vm^{-1}
- (D) CNm^{-1}

Correct Answer: **(A)**

Level: **Easy**

Tagging:

Q283. Unit of impulse is

- (A) Newton
- (B) kg-m
- (C) kg-m/s
- (D) Joule

Correct Answer: **(C)**

Level: **Easy**

Tagging:

Q284. Unit of magnetic moment is

- (A) Ampere-metre²
- (B) Ampere – metre
- (C) Weber – metre²
- (D) Weber/metre

Correct Answer: **(A)**

Level: **Easy**

Tagging:

Q285. Unit of moment of inertia in MKS system

- (A) kg×cm²
- (B) kg/cm²
- (C) kg×m²
- (D) Joule×m

Correct Answer: **(C)**

Level: **Easy**

Tagging:

Q286. Unit of power is

- (A) Kilowatt
- (B) Kilowatt-hour
- (C) Dyne
- (D) Joule

Correct Answer: **(A)**

Level: **Easy**

Tagging:

Q287. Universal time is based on

- (A) Rotation of earth on its axis
- (B) Oscillations of quartz crystal
- (C) Vibrations of cesium atom
- (D) Earth's orbital motion around the sun

Correct Answer: **(A)**

Level: **Easy**

Tagging:

Q288. Wavelength of ray of light is 0.00006 m. It is equal to

- (A) 6 micron
- (B) 60 micron
- (C) 600 micron
- (D) 0.6 micron

Correct Answer: **(B)**

Level: **Easy**

Tagging:

Q289. What are the units of $K=1/4\pi\epsilon_0$

- (A) C² N⁻¹ m⁻²
- (B) Nm² C⁻²
- (C) Nm² C²
- (D) Unitless

Correct Answer: **(B)**

Level: **Easy**

Tagging:

Q290. What is dimensional formula of thermal conductivity?

- (A) [MLT⁻¹ θ⁻¹]
- (B) [MLT⁻³ θ⁻¹]
- (C) [M² LT⁻³ θ⁻²]
- (D) [ML² T⁻² θ]

Correct Answer: **(B)**

Level: **Easy**

Tagging:

Q291. What is the area of a disc of radius 1.1 cm?

- (A) 3.8028571 cm^2
- (B) 3.8029 cm^2
- (C) 3.803 cm^2
- (D) 3.8 cm^2

Correct Answer: **(D)**

Level: **Easy**

Tagging:

Q292. What is the dimensional formula of (planck's constant)/(linear momentum) ?

- (A) $[M^0 L^0 T^0]$
- (B) $[M^0 L^0 T]$
- (C) $[M^0 LT^0]$
- (D) $[MLT^{-1}]$

Correct Answer: **(C)**

Level: **Easy**

Tagging:

Q293. What is the dimensional formula of mc^2 , where the letters have their usual meanings?

- (A) $[MLT^{-1}]$
- (B) $[ML^0 T^0]$
- (C) $[ML^2 T^{-2}]$
- (D) $[M^{-1} L^3 T^6]$

Correct Answer: **(C)**

Level: **Easy**

Tagging:

Q294. What is the power of a 100 W bulb in CGS units?

- (A) 10^6 ergs^{-1}
- (B) 10^7 ergs^{-1}
- (C) 10^9 ergs^{-1}
- (D) $10^{11} \text{ ergs}^{-1}$

Correct Answer: **(C)**

Level: **Easy**

Tagging:

Q295. When a wave traverses a medium, the displacement of a particle located at x at a time t is given by $y = a \sin(bt - cx)$, where a, b and c are constants of the wave. Which of the following is a quantity with dimensions

- (A) y/a
- (B) bt
- (C) cx
- (D) b/c

Correct Answer: **(D)**

Level: **Easy**

Tagging:

Q296. Which has not the same unit as other?

- (A) Watt-sec
- (B) Kilowatt-hour
- (C) eV
- (D) Js

Correct Answer: **(D)**

Level: **Easy**

Tagging:

Q297. Which is different from others by units

- (A) Phase difference
- (B) Mechanical equivalent
- (C) Loudness of sound
- (D) Poisson's ratio

Correct Answer: **(D)**

Level: **Easy**

Tagging:

Q298. Which of the following groups have different dimensions

- (A) Potential difference, EMF, voltage
- (B) Pressure, stress, young's modulus
- (C) Heat , energy, work-done
- (D) Dipole moment, electric flux, electric field

Correct Answer: **(D)**

Level: **Easy**

Tagging:

Q299. Which of the following cannot be regarded as an essential characteristic of a unit of measurement?

- (A) Inaccessibility
- (B) Indestructibility
- (C) Invariability
- (D) Reproducibility

Correct Answer: **(A)**

Level: **Easy**

Tagging:

Q300. Which of the following five physical parameters have the same dimensions

- (A) Energy density
- (B) Refractive index
- (C) Dielectric constant
- (D) Young's modulus
- (E) Magnetic field
- (A) (A) and (D)
- (B) (A) and (E)
- (C) (B) and (D)
- (D) (C) and (E)

Correct Answer: **(A)**

Level: **Easy**

Tagging:

Q301. Which of the following is dimensionally correct

- (A) Pressure = Energy per unit area
- (B) Pressure = Energy per unit volume
- (C) Pressure = Force per unit volume
- (D) Pressure = Momentum per unit volume per unit time

Correct Answer: **(B)**

Level: **Easy**

Tagging:

Q302. Which of the following is dimensionless?

- (A) v^2/rg
- (B) $(v^2 g)/r$
- (C) vg/r
- (D) $v^2 rg$

Correct Answer: **(A)**

Level: **Easy**

Tagging:

Q303. Which of the following is not a unit of energy

- (A) W-s
- (B) kg-m/sec
- (C) N-m
- (D) Joule

Correct Answer: **(B)**

Level: **Easy**

Tagging:

Q304. Which of the following is the smallest unit

- (A) Millimetre
- (B) Angstrom
- (C) Fermi
- (D) Metre

Correct Answer: **(C)**

Level: **Easy**

Tagging:

Q305. Which of the following is the unit of specific heat?

- (A) $\text{Jkg } ^\circ\text{C}^{-1}$
- (B) $\text{Jkg}^{-1} ^\circ\text{C}^{-1}$
- (C) $\text{kg } ^\circ\text{CJ}^{-1}$
- (D) $\text{J/kg}^{-1} ^\circ\text{C}^{-2}$

Correct Answer: **(B)**

Level: **Easy**

Tagging:

Q306. Which of the following pairs does not have similar dimensions

- (A) Stress and pressure
- (B) Angle and strain
- (C) Tension and surface tension
- (D) Planck's constant and angular momentum

Correct Answer: **(C)**

Level: **Easy**

Tagging:

Q307. Which of the following pairs is wrong

- (A) Pressure-Barometer
- (B) Relative density-Pyrometer
- (C) Temperature-Thermometer
- (D) Earthquake-Seismograph

Correct Answer: **(B)**

Level: **Easy**

Tagging:

Q308. Which of the following quantities has not been expressed in proper unit

- (A) Torque : Newton metre
- (B) Stress : Newton metre⁻²
- (C) Modulus of elasticity : Newton metre⁻²
- (D) Surface tension : Newton metre⁻²

Correct Answer: **(D)**

Level: **Easy**

Tagging:

Q309. Which of the following quantity is expressed as force per unit area

- (A) Work
- (B) Pressure
- (C) Volume
- (D) Area

Correct Answer: **(B)**

Level: **Easy**

Tagging:

Q310. Which of the following relation is wrong

- (A) $1 \text{ ampere} \times 1 \text{ ohm} = 1 \text{ volt}$
- (B) $1 \text{ watt} \times 1 \text{ sec} = 1 \text{ joule}$
- (C) $1 \times \text{newton per coulomb} = 1 \text{ volt per meter}$
- (D) $1 \text{ coulomb} \times 1 \text{ volt} = 1 \text{ watt}$

Correct Answer: **(D)**

Level: **Easy**

Tagging:

Q311. Which of the following represents a volt

- (A) Joule/second
- (B) Watt/ampere
- (C) Watt/coulomb
- (D) Coulomb/joule

Correct Answer: **(B)**

Level: **Easy**

Tagging:

Q312. Which of the following sets of quantities have same dimensional formula?

- (A) Frequency, angular frequency and angular momentum
- (B) Surface tension, stress and spring constant
- (C) Acceleration, momentum and retardation
- (D) Work, energy and torque

Correct Answer: **(D)**

Level: **Easy**

Tagging:

Q313. Which of the following units denotes the dimensions $[ML^2/Q^2]$, where Q denotes the electric charge?

- (A) $Wb\,m^{-2}$
- (B) Henry (H)
- (C) $H\,m^{-2}$
- (D) Weber (Wb)

Correct Answer: **(B)**

Level: **Easy**

Tagging:

Q314. Which of the two have same dimensions

- (A) Force and strain
- (B) Force and stress
- (C) Angular velocity and frequency
- (D) Energy and strain

Correct Answer: **(C)**

Level: **Easy**

Tagging:

Q315. Which one has the dimensions different from the remaining three

- (A) Power
- (B) Work
- (C) Torque
- (D) Energy

Correct Answer: **(A)**

Level: **Easy**

Tagging:

Q316. Which one of the following does not have the same dimensions

- (A) Work and energy
- (B) Angle and strain
- (C) Relative density and refractive index
- (D) Planck constant and energy

Correct Answer: **(D)**

Level: **Easy**

Tagging:

Q317. Which one of the following is not a fundamental SI unit?

- (A) Ampere
- (B) Candela
- (C) Newton
- (D) Kelvin

Correct Answer: **(C)**

Level: **Easy**

Tagging:

Q318. Which one of the following is not a unit of young's modulus

- (A) $N\,m^{-1}$
- (B) $N\,m^{-2}$
- (C) $Dyne\,cm^{-2}$
- (D) Mega Pascal

Correct Answer: **(A)**

Level: **Easy**

Tagging:

Q319. Which one of the following pairs of quantities and their unit is proper match?

- (A) Electric field-coulomb/m

- (B) Magnetic flux-weber
- (C) Power-farad
- (D) Capacitance-henry

Correct Answer: **(B)**

Level: **Easy**

Tagging:

Q320. Which one of the following units is not that of mutual inductance?

- (A) Henry
- (B) (Weber)⁻¹
- (C) Ohm second
- (D) Volt second (ampere)⁻¹

Correct Answer: **(B)**

Level: **Easy**

Tagging:

Q321. Which pair has the same dimensions

- (A) Work and power
- (B) Density and relative density
- (C) Momentum and impulse
- (D) Stress and strain

Correct Answer: **(C)**

Level: **Easy**

Tagging:

Q322. Which physical quantities have same dimensions

- (A) Force and power
- (B) Torque and energy
- (C) Torque and power
- (D) Force and torque

Correct Answer: **(B)**

Level: **Easy**

Tagging:

Q323. Which physical quantities have the same dimension

- (A) Couple of force and work
- (B) Force and power
- (C) Latent heat and specific heat
- (D) Work and power

Correct Answer: **(A)**

Level: **Easy**

Tagging:

Q324. With the usual notations, the following equation

$$S_t = u + \frac{1}{2} a(2t-1)$$

is

- (A) Only numerically correct
- (B) Only dimensionally correct
- (C) Both numerically and dimensionally correct
- (D) Neither numerically nor dimensionally correct

Correct Answer: **(C)**

Level: **Easy**

Tagging:

Q325. Write dimensional formula for the intensity of radiation

- (A) $M^1 L^0 T^3$
- (B) $M^1 L^0 T^{-3}$
- (C) $M^1 L^2 T^{-2}$
- (D) $M^1 L^2 T^{-3}$

Correct Answer: **(B)**

Level: **Easy**

Tagging:

Q326. $X=3YZ^2$ find dimension of Y in (MKSA) system, If X and Z are the dimensions of capacity and magnetic field respectively

- (A) $M^{-3} L^{-2} T^{-4} A^{-1}$
- (B) ML^{-2}

(C) $M^{-3} L^{-2} T^4 A^4$

(D) $M^{-3} L^{-2} T^8 A^4$

Correct Answer: **(D)**

Level: **Easy**

Tagging:

Q327. Young's modulus of a material has the same units as

(A) Pressure

(B) Strain

(C) Compressibility

(D) Force

Correct Answer: **(A)**

Level: **Easy**

Tagging:

The dimensional method is a very convenient way of finding the dependence of a physical quantity on other physical quantities of a given system. This method has its own limitations. In a complicated situation, it is often not easy to guess the factors on which a physical quantity will depend. Secondly, this method gives no information about the dimensionless proportionality constant. Thirdly, this method is used only if a physical quantity depends on the product of other physical quantities. Fourthly, this method will not work if a physical quantity depends only on another quantity as a trigonometric or exponential function. Finally, this method does not give complete information in cases where a physical quantity depends on more than three quantities in problems in mechanics.

In dimensional method, the dimensionless proportionality constant is to be determined

- (a) experimentally
- (b) by a detailed mathematical derivation
- (c) by using the principle of dimensional homogeneity.
- (d) by equating the powers of M, L and T.

Q328.

(A) a,c

(B) c,d

(C) a,b

(D) None

Correct Answer: **(C)**

Level: **Moderate**

Tagging: **Remembering**

Match the physical quantities in column I with their SI units in column II

Column I

Column II

- (a) Stefan's constant
- (b) Universal gas constant
- (c) Electrical permittivity
- (d) Magnetic permeability

- (p) $JK^{-1} mol^{-1}$
- (q) Fm^{-1}
- (r) Hm^{-1}
- (s) $Wm^{-2} K^{-4}$

Q329.

(A) a - s, b - p, c - q, d - r

(B) a - p, b - q, c - r, d - s

(C) a - r, b - p, c - q, d - r

(D) None

Correct Answer: **(A)**

Level: **Moderate**

Tagging: **Understanding**

When a wave traverses a medium, the displacement of a particle located at x at time t is given by

$$y = a \sin (bt - cx)$$

where a , b and c are constants of the wave. Which of the following are dimensionless quantities?

- (a) y/a (b) bt
(c) cx (d) $\frac{b}{c}$

Q330.

- (A) a
(B) a, b
(C) a, b, c
(D) None

Correct Answer: **(C)**

Level: **Moderate**

Tagging: **Understanding**

The equation of state for n moles of an ideal gas is

$$PV = nRT$$

where R is the universal gas constant and P , V and T have the usual meanings. What are the dimensions of R ?

Q331.

- (A) $M^0 L T^{-2} K^{-1} \text{ mol}^{-1}$
(B) $M L^2 T^{-2} K^{-1} \text{ mol}^{-1}$
(C) $M^0 L^2 T^{-2} K^{-1} \text{ mol}^{-1}$
(D) $M L^{-2} T^{-2} K^{-1} \text{ mol}^{-1}$

Correct Answer: **(B)**

Level: **Moderate**

Tagging: **Remembering**

Choose the pair of physical quantities which have identical dimensions.

- (a) Impulse and linear momentum
(b) Planck's constant and angular momentum
(c) Moment of inertia and moment of force
(d) Young's modulus and pressure

Q332.

- (A) a, b, c
(B) a, b, d
(C) a, c, d
(D) b, c, d

Correct Answer: **(B)**

Level: **Moderate**

Tagging: **Remembering**

Which of the following has the dimensions $ML^{-1} T^{-1}$?

Q333.

- (A) Surface tension
(B) Coefficient of viscosity
(C) Bulk modulus
(D) Angular momentum

Correct Answer: **(B)**

Level: **Moderate**

Tagging: **Remembering**

Match the physical quantities in column I with their dimensions given in column II

Column I Column II

- | | |
|------------------------|---|
| (a) Impulse equals | (p) Rate of change of linear momentum |
| (b) Force equals | (q) the rate at which energy is consumed |
| (c) Power is | (r) the dot product of force and displacement vectors |
| (d) Work is defined as | (s) change in linear momentum |

Q334.

- (A) a-s, b-p, c-q, d-r
 (B) a-p, b-q, c-r, d-s
 (C) a-q, b-p, c-r, d-s
 (D) None

Correct Answer: **(A)**

Level: **Moderate**

Tagging: **Remembering**

According to the quantum theory, the energy E of a photon of frequency ν is given by

$$E = h\nu$$

where h is Planck's constant. What is the dimensional formula for h ?

Q335.

- (A) $M L^2 T^{-2}$
 (B) $M L^2 T^{-1}$
 (C) $M L^2 T$
 (D) $M L^2 T^2$

Correct Answer: **(B)**

Level: **Moderate**

Tagging: **Evaluating**

Time period T of a simple pendulum may depend on m , the mass of the bob, l , the length of the string and g , the acceleration due to gravity, i.e.

$$T \propto m^a l^b g^c$$

What are the values of a , b and c ?

Q336.

- (A) $0, \frac{1}{2}, -\frac{1}{2}$
 (B) $0, -\frac{1}{2}, \frac{1}{2}$
 (C) $\frac{1}{2}, 0, -\frac{1}{2}$
 (D) $-\frac{1}{2}, 0, \frac{1}{2}$

Correct Answer: **(A)**

Level: **Moderate**

Tagging: **Evaluating**

Match the physical quantities in column I with their dimensions in column II. M, L, T, K and A denote the dimensions of mass, length, time, temperature and electric current respectively

Column I

Column II

- | | |
|------------------------------|-----------------------|
| (a) Viscosity | (p) $MLT^{-3} K^{-1}$ |
| (b) Thermal conductivity | (q) $MLT^{-3} A^{-1}$ |
| (c) Electric field | (r) $ML^{-1} T^{-1}$ |
| (d) Magnetic induction field | (s) $MT^{-2} A^{-1}$ |

Q337.

- (A) a - r, b - p, c - q, d - s

- (B) a - p, b - s, c - r, d - q
 (C) a - p, b - q, c - s, d - r
 (D) None

Correct Answer: **(A)**

Level: **Moderate**

Tagging: **Evaluating**

Q338. A physical quantity A is related to four observables a,b,c and d as follows

$$A = (a^2 b^3) / (c \sqrt{d})$$

The percentage errors of measurement in a,b,c and d are 1%, 3%, 2% and 2% respectively. What is the percentage error in the quantity A?

- (A) 12%
 (B) 7%
 (C) 5%
 (D) 14%

Correct Answer: **(D)**

Level: **Moderate**

Tagging: **Evaluating**

Q339. A physical quantity A is related to four observations a,b,c and d as follows, $A = (a^2 b^3) / (c \sqrt{d})$. The percentage error of measurement in a,b,c and d are 1%,3%,2% and 2% respectively. What is the percentage error in the quantity A

- (A) 12%
 (B) 7%
 (C) 5%
 (D) 14%

Correct Answer: **(D)**

Level: **Moderate**

Tagging: **Evaluating**

Q340. A physical quantity is given by $X = [M^a L^b T^c]$. The percentage error in measurement of M,L and T are α , β and γ respectively. Then, the maximum % error in the quantity X is

- (A) $\alpha\alpha + b\beta + c\gamma$
 (B) $\alpha\alpha + b\beta - c\gamma$
 (C) $\alpha/\alpha + b/\beta + c/\gamma$
 (D) None of these

Correct Answer: **(A)**

Level: **Moderate**

Tagging: **Evaluating**

Q341. A quantity X is given by $\epsilon_0 L \Delta V / \Delta t$, where ϵ_0 is the permittivity of free space, L is a length, ΔV is a potential difference and Δt is a time interval. The dimensional formula for X is the same as that of

- (A) Electrical resistance
 (B) Electric charge
 (C) Electric voltage
 (D) Electric current

Correct Answer: **(D)**

Level: **Moderate**

Tagging: **Evaluating**

Q342. A spectrometer gives the following reading when used to measure the angle of a prism

Main scale reading : 58.5 degree

Vernier scale reading : 09 divisions

Given that 1 division on main scale corresponds to 0.5 degree. Total divisions on the verni

- (A) 58.59 Degree
 (B) 58.77 Degree
 (C) 58.65 Degree
 (D) 59 Degree

Correct Answer: **(C)**

Level: **Moderate**

Tagging: **Evaluating**

Q343. A student has measured the length of a wire equal to 0.04580 m. This value of length has the number of significant figures equal to

- (A) Five
 (B) Four
 (C) Six

(D) None of these

Correct Answer: **(B)**

Level: **Moderate**

Tagging: **Evaluating**

Q344. A student performs an experiment for determination of $g(=4\pi^2 l/T^2)$, $l \approx 1\text{m}$, and he commits an error of Δl . For T he takes the time of n oscillations with the stop watch of least count ΔT and he commits a human error of 0.1 s . For wh

(A) $\Delta L=0.5, \Delta T=0.1, n=20$

(B) $\Delta L=0.5, \Delta T=0.1, n=50$

(C) $\Delta L=0.5, \Delta T=0.01, n=20$

(D) $\Delta L=0.5, \Delta T=0.05, n=50$

Correct Answer: **(D)**

Level: **Moderate**

Tagging: **Evaluating**

Q345. A wire has a mass $0.3 \pm 0.003\text{g}$, radius $0.5 \pm 0.005\text{ mm}$ and length $6 \pm 0.06\text{ cm}$. The maximum percentage error in the measurement of its density is

(A) 1

(B) 2

(C) 3

(D) 4

Correct Answer: **(D)**

Level: **Moderate**

Tagging: **Evaluating**

Q346. An object is moving through the liquid. The viscous damping force acting on it is proportional to the velocity. Then dimension of constant of proportionality is

(A) $\text{ML}^{-1} \text{T}^{-1}$

(B) MLT^{-1}

(C) $\text{M}^0 \text{LT}^{-1}$

(D) $\text{ML}^0 \text{T}^{-1}$

Correct Answer: **(D)**

Level: **Moderate**

Tagging: **Evaluating**

Q347. Choose the incorrect statement out of the following

(A) Every measurement by any measuring instrument has some error

(B) Every calculated physical quantity that is based on measured values has some error

(C) A measurement can have more accuracy but less precision and vice versa

(D) The percentage error is different from relative error

Correct Answer: **(D)**

Level: **Moderate**

Tagging: **Evaluating**

Q348. Consider a new system of units in which c (speed of light in vacuum), h (Planck's constant) and G (gravitational constant) are taken as fundamental units. Which of the following would correctly represent mass in this new system?

(A) $\sqrt{hc/G}$

(B) $\sqrt{Gc/h}$

(C) $\sqrt{hG/c}$

(D) \sqrt{hGc}

Correct Answer: **(A)**

Level: **Moderate**

Tagging: **Evaluating**

Q349. For the equation $F \propto A^a v^b d^c$, where F is the force, A is the area v is the velocity and d is the density, the value of a, b and c are respectively

(A) 1,2,1

(B) 2,1,1

(C) 1,1,2

(D) 0,1,1

Correct Answer: **(A)**

Level: **Moderate**

Tagging: **Evaluating**

Q350. From the equation $\tan\theta = rg/v^2$, one can obtain the angle of banking θ for a cyclist taking a curve (the symbols have their usual meanings). Then say it is,

- (A) Both dimensionally and numerically correct
- (B) Neither numerically nor dimensionally correct
- (C) Dimensionally correct only
- (D) Numerically correct only

Correct Answer: **(C)**

Level: **Moderate**

Tagging: **Evaluating**

Q351. Given that $y = A \sin[(2\pi/\lambda)(ct-x)]$ where, y and x are measured in metre. Which of the following statements is true?

- (A) The unit of λ is same as that of x and A
- (B) The unit of λ is same as that of x but not of A
- (C) The unit of c is same as that of $2\pi/\lambda$
- (D) The unit of $(ct-x)$ is same as that of $2\pi/\lambda$

Correct Answer: **(A)**

Level: **Moderate**

Tagging: **Evaluating**

Q352. Given that $r = m^2 \sin pt$, where t represents time. If the unit of m is N , then the unit of r is

- (A) N
- (B) N^2
- (C) $N s$
- (D) $N^2 s$

Correct Answer: **(B)**

Level: **Moderate**

Tagging: **Evaluating**

Q353. Given that u is speed, r is the radius and g is the acceleration due to gravity. Which of the following is dimensionless

- (A) u^2/rg
- (B) $u^2 r/g$
- (C) $u^2 g/r$
- (D) $u^2 rg$

Correct Answer: **(A)**

Level: **Moderate**

Tagging: **Evaluating**

Q354. Given, Force $= a/(\text{density} + \beta^3)$
What are the dimensions of a, β ?

- (A) $[ML^2 T^{-2}]$, $[ML^{-1/3}]$
- (B) $[M^2 L^4 T^{-2}]$, $[M^{1/3} L^{-1}]$
- (C) $[M^2 L^{-2} T^{-2}]$, $[M L^{-1}]^{1/3}$
- (D) $[M^2 L^{-2} T_2]$, $[ML^{-3}]$

Correct Answer: **(C)**

Level: **Moderate**

Tagging: **Evaluating**

Q355. How many wavelengths of the Kr^{89} are there in one metre?

- (A) 658189.63
- (B) 2348123.73
- (C) 1650763.73
- (D) 1553164.12

Correct Answer: **(C)**

Level: **Moderate**

Tagging: **Evaluating**

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The dimensional method cannot be used to obtain dependence of

- (a) the height to which a liquid rises in a capillary tube on the angle of contact
- (b) speed of sound in an elastic medium on the modulus of elasticity.
- (c) height to which a body, projected upwards with a certain velocity, will rise on time t .
- (d) the decrease in energy of a damped oscillator on time t .

Q356.

- (A) a,c,d
- (B) b,c,d
- (C) a,b,c
- (D) None

Correct Answer: **(A)**

Level: **Difficult**

Tagging: **Understanding**

Statement-1

The dimensional method cannot be used to obtain the dependence of the work done by a force F on the angle θ between force F and displacement x .

Statement-2

Q357. All trigonometric functions are dimensionless.

- (A) Statement – 1 is true, Statement – 2 is true and Statement – 2 is the correct explanation for Statement – 1.
- (B) Statement – 1 is true, Statement – 2 is true but Statement – 2 is not the correct explanation for Statement – 1.
- (C) Statement – 1 is true, Statement – 2 is false.
- (D) Statement – 1 is false, Statement – 2 is true.

Correct Answer: **(A)**

Level: **Difficult**

Tagging: **Evaluating**

The thermo emf (E) of a thermocouple varies with temperature as

$$E = at + bt^2$$

where t is the temperature (in $^{\circ}\text{C}$) of the hot junction; the cold junction being kept at 0°C and a and b are constants of the couple.

(a) The neutral temperature of the thermocouple

is $-\frac{a}{2b}$.

(b) The neutral temperature of the thermocouple

is $\frac{a}{2b}$.

(c) The SI unit of a is volt per kelvin.

Q358. (d) The dimensions of b are $[\text{ML}^2 \text{T}^{-3} \text{A}^{-1} \text{K}^{-2}]$

(A) a,c,d

(B) a,b,d

(C) b,c,d

(D) None

Correct Answer: **(A)**

Level: **Difficult**

Tagging: **Understanding**

The Van der Waal equation for n moles of a real gas is

$$\left(P + \frac{a}{V^2}\right)(V - b) = nRT$$

where P is the pressure, V is the volume, T is the absolute temperature, R is the molar gas constant and a , b are Van der Waal constants. The dimensions of

(a) a are the same as those of PV^2

(b) b are the same as those of V

(c) $\frac{a}{V}$ are the same as those of RT

Q359. (d) bP are the same as those of RT .

(A) a

(B) a,b

(C) a,b,c

(D) a,b,c,d

Correct Answer: **(D)**

Level: **Difficult**

Tagging: **Evaluating**

Q360. A screw gauge gives the following reading when used to measure the diameter of a wire.

Main scale reading : 0 mm

Circular scale reading : 52 divisions

Given that 1 mm on main scale corresponds to 100 divisions of the circular scale.

The diameter of wire from the above data is:-

(A) 0.052 cm

(B) 0.026 cm

(C) 0.005 cm

(D) 0.52 cm

Correct Answer: **(A)**

Level: **Difficult**

Tagging: **Evaluating**