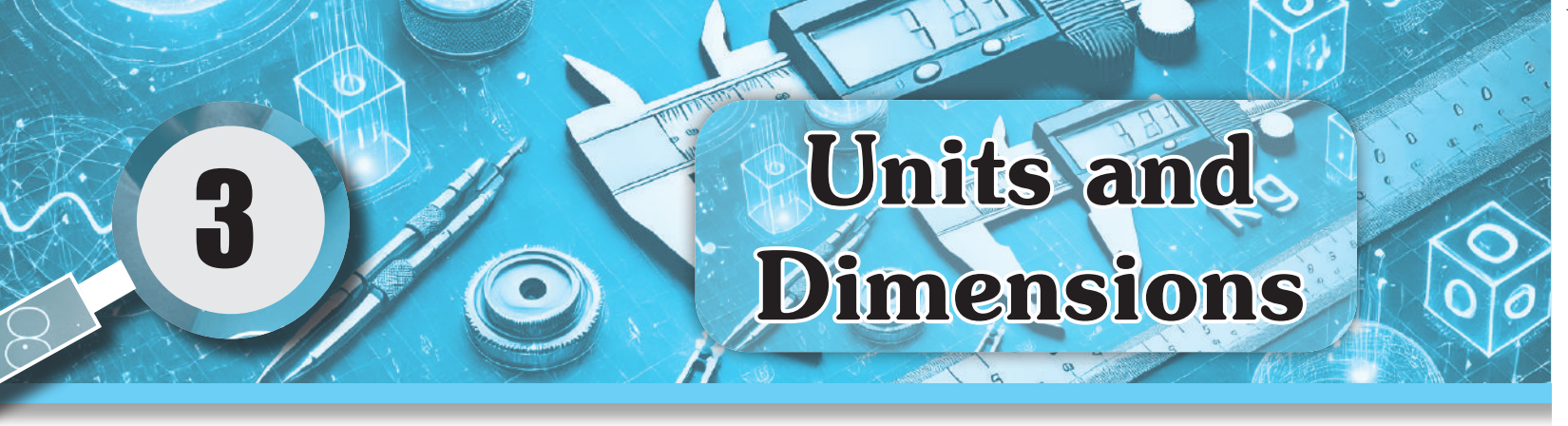
MR Physics

Question Solving Med Easy

Complete 11th & 12th Syllabus For NEET and JEE Aspirants

Contents



3 Units and Dimensions

Physical Quantity

1. Which of the following group of physical quantity can be considered as a group of fundamental physical quantity.
   (*a*) Force, mass time
   (*b*) Mass, force, acceleration
   (*c*) Velocity, time, displacement
   (*d*) Velocity, momentum, mass
   (*e*) None of the above
2. Which does not have same unit as other:-
   (*a*) watt - sec (*b*) kilowatt - hour
   (*c*) eV (*d*) Joule - sec
3. Unit of distance is :
   (*a*) Femtometer (*b*) Angstrom
   (*c*) Parsec (*d*) Light year
   (*e*) All of these
4. **Assertion (A):** Astronomical unit, light year and parsec measures distance
   Reason (R): Each has dimension of distance.
   (*a*) If both Assertion (A) & Reason (R) are True & the Reason (R) is a correct explanation of the Assertion (A).
   (*b*) If both Assertion (A) & Reason (R) are True but Reason (R) is not a correct explanation of the Assertion (A).
   (*c*) If Assertion (A) is True but the Reason (R) is False.
   (*d*) If both Assertion (A) & Reason (R) are false.
5. Which of the following is a characteristic of unit?
   (*a*) The unit must be universally accepted
   (*b*) It must be invariable and well defined
   (*c*) It must be of suitable size and easily available
   (*d*) All the above
6. Ratio of two similar physical quantity has units.
   (*a*) True (*b*) False

Unit Conversion

7. The magnitude of physical quantity and units are directly proportional to each other.
   (*a*) True (*b*) False
8. If Area of object is $5m^2$ then find its value in C.G.S unit?
   (*a*) 5×10^4 cm^2 (*b*) 3×10^4 m^2
   (*c*) 2×10^4 cm^2 (*d*) 1×10^4 m^2
9. Convert 25 m/s in C.G.S unit
10. If unit of length becomes double then value of area $5m^2$ in new unit will be :-
    (*a*) $\frac{1}{4}$ (*b*) $\frac{3}{2}$ (*c*) $\frac{5}{4}$ (*d*) $\frac{5}{2}$
11. Convert 1 newton into Dyne.
    (*a*) 10^4 (*b*) 10^5 (*c*) 10^3 (*d*) 10^7
12. Convert values of 10 joule in CGS unit?
    (*a*) 10×10^7 (*b*) 1×10^7 (*c*) 1×10^5 (*d*) 3×10^5
13. In a new system of units, unit of mass is x kg, unit of length is y metre and unit of time is z second. Now if 1 newton = F new units then F =
    (*a*) $\frac{z}{xy}$ (*b*) $\frac{z^2}{xy}$ (*c*) $\frac{z}{xy^2}$ (*d*) $\frac{z}{x^2y}$
14. In new system of unit, unit of length is 10 m, unit of time is 2s, unit of mass is 5 kg, then find unit of torque in new system of unit.
    (*a*) 125 Nm (*b*) 0.125 Nm
    (*c*) 8 Nm (*d*) 8×10^{-3} Nm
15. If unit of length 10 m and unit of mass is 5 kg and unit of time is 2 sec then, find value of 10 Joule energy in new system of unit.
    (*a*) $\frac{2}{25}$ (*b*) $\frac{3}{8}$ (*c*) $\frac{1}{16}$ (*d*) $\frac{2}{3}$
16. The density of a material in CGS system of units is 4 g cm^{-3} In a system of units in which unit of length is 10 cm and unit of mass is 100 g, the value of density of material will be
    (*a*) 0.04 (*b*) 0.4 (*c*) 40 (*d*) 400
17. In a new system of units, unit of mass is α kg unit of length is β m and unit of time is γ s. In this symstem, 10J will be represented as.
    (*a*) $10\alpha^{-1}\beta^2\gamma^2$ (*b*) $10\alpha^{-2}\beta^{-1}\gamma^{-2}$
    (*c*) $10\alpha^{-1}\beta^{-2}\gamma^2$ (*d*) $10\alpha\beta^2\gamma^{-2}$

18. Given below are two statements:

Statement I: Two physical quantities having same dimensions, may have different units.

Statement II: Shake and light year, both measure time.

In the light of the above statements, choose the most appropriate answer from the options given below:

(*a*) Both statement I and statement II are correct.
(*b*) Statement I is correct and statement II is incorrect
(*c*) Statement I is incorrect and statement II is correct
(*d*) Both statements I and statements II are incorrect

19. Light year is used to measure:

(*a*) distance between stars
(*b*) distance between atoms
(*c*) revolution time of earth around sun
(*d*) none of these

20. The wrong unit conversion among the following is :

(*a*) 1 angstrom = 10^{-10} m
(*b*) 1 fermi = 10^{-15} m
(*c*) 1 light year = 9.46×10^{15} m
(*d*) 1 astronomical unit = 1.496×10^{-11} m

21. Which of the following is not the unit of time ?

(*a*) microsecond (*b*) leap year
(*c*) lunar months (*d*) parallactic second
(*e*) Solar day

22. The unit of Stefan's constant σ is :

(If rate of heat radiation is given by σAT^4 where *A* is Area and T is temperature)

(*a*) $Wm^{-2}K^{-1}$ (*b*) $Wm^2 K^{-4}$
(*c*) $Wm^{-2}K^{-4}$ (*d*) $Wm^{-2} K^4$

23. Match Column-I with Column-II and select correct option.

Column-I		Column-II	
(A)	Mega	(P)	10^{-9}
(B)	Nano	(Q)	10^{-15}
(C)	Micro	(R)	10^{6}
(D)	Femto	(S)	10^{-6}
(E)	Pico	(T)	10^{-12}

	A	B	C	D	E
(*a*)	R	P	S	T	Q
(*b*)	S	P	R	Q	T
(*c*)	R	P	S	Q	T
(*d*)	S	P	R	T	Q

24. Which of the following ratios express pressure ?

(i) Force/Area
(ii) Energy/Volume
(iii) Energy/Area
(iv) Force/Volume

(*a*) Only (i) is correct. (*b*) Only (ii) is correct.
(*c*) Only (iii) is correct. (*d*) Both (i) and (ii) are correct.

25. The unit of thermal conductivity is :

(*a*) $Wm^{-1}K^{-1}$ (*b*) $Hm\ K^{-1}$
(*c*) $Jm^{-1}\ K^{-1}$ (*d*) $Wm\ K^{-1}$

Dimension

26. The dimension of mutual inductance is:

(*a*) $[ML^2T^{-2}\ A^{-1}]$ (*b*) $[ML^2T^{-3}\ A^{-1}]$
(*c*) $[ML^2T^{-2}\ A^{-2}]$ (*d*) $[ML^2T^{-3}\ A^{-2}]$

27. The SI unit of a physical quantity is pascal-second. The dimensional formula of this quantity will be

(*a*) $[ML^{-1}T^{-1}]$ (*b*) $[ML^{-1}T^{-2}]$
(*c*) $[ML^2T^{-1}]$ (*d*) $[ML^{-1}L^3\ T^0]$

28. Dimension of Stress

29. Dimension of electric resistance

30. Dimension of Self Induction

31. Dimension of Permeability

32. Dimension of Magnetic field and magnetic flux

33. Dimension of Coefficient of viscosity

34. Dimension of $\frac{1}{\mu_0 \in_0}$ should be equal to

(*a*) T^2/L^2 (*b*) T/L
(*c*) L^2/T^2 (*d*) L/T

35. If the dimensions of a physical quantity are given by $M^aL^bT^c$, then the physical quantity will be

(*a*) Velocity if $a = 1, b = 0, c = -1$
(*b*) Acceleration if $a = 1, b = 0, c = -2$
(*c*) Force if $a = 0, b = -1, c = -2$
(*d*) Pressure if $a = 1, b = -1, c = -2$

36. If E, L, M and G denote the quantities as energy, angular momentum, mass and constant of gravitation respectively, then the dimensions of *P* in the formula $P = EL^2M^{-5}G^{-2}$ are:

(*a*) $[M^0L^0T^0]$ (*b*) $[M^1L^1T^{-2}]$
(*c*) $[M^0L^1T^0]$ (*d*) $[M^{-1}L^{-1}T^2]$

37. A quantity *f* is given by $f = \sqrt{\frac{hc^5}{G}}$ where c is speed of light, G universal gravitational constant and *h* is the Planck's constant. Dimension of *f* is that of

(*a*) Energy (*b*) Momentum
(*c*) Area (*d*) Volume

38. Which two of the following five physical parameters have the same dimensions?

1. Energy density 2. Refractive index
3. Dielectric constant 4. Young's modulus
5. Magnetic field

(*a*) 1 and 4 (*b*) 1 and 5
(*c*) 2 and 4 (*d*) 3 and 5

39. Which of the following pairs have same dimensional formula?

(*a*) Bulk modulus and energy density

(*b*) Latent heat and velocity

(*c*) Specific heat and latent heat

(*d*) Both (*a*) and (*b*)

40. The unit of electric flux is

(*a*) $\frac{Vm^2}{C}$ (*b*) volt-second

(*c*) $\frac{Nm^2}{C}$ (*d*) $\frac{N}{C^2\ m}$

41. Match List-I with List-II:

List-I		List-II	
A.	Surface tension	I.	kg $m^{+1}s^{-1}$
B.	Pressure	II.	kg $m^{-1}s^{-2}$
C.	Viscosity	III.	kg $m^{-1}s^{-2}$
D.	Impulse	IV.	kg s^{-2}

Choose the correct answer from the options given below:

(*a*) A-IV, B-III, C-II, D-I (*b*) A-IV, B-III, C-I, D-II

(*c*) A-III, B-IV, C-I, D-II (*d*) A-II, B-I, C-III, D-IV

42. Match List-I with List-II:

List-I		List-II	
A.	Torque	I.	kg $m^{-1}s^{-2}$
B.	Energy density	II.	kg ms^{-1}
C.	Pressure gradient	III.	kg $m^{-2}s^{-2}$
D.	Impulse	IV.	kg $m^2\ s^{-2}$

Choose the correct answer from the options given below:

(*a*) A-IV, B-III, C-I, D-II (*b*) A-I, B-IV, C-III, D-II

(*c*) A-IV, B-I, C-II, D-III (*d*) A-IV, B-I, C-III, D-II

43. Match List-I with List-II:

List-I		List-II	
A.	Planck's constat (h)	I.	$[M^1L^2T^{-2}]$
B.	Stopping potential (Vs)	II.	$[M^1L^1T^{-1}]$
C.	Work function (ϕ)	III.	$[M^1L^2T^{-1}]$
D.	Momentum (p)	IV.	$[M^1L^2T^{-3}A^{-1}]$

(*a*) A-III, B-I, C-II, D-IV (*b*) A-III, B-IV, C-I, D-II

(*c*) A-II, B-IV, C-III, D-I (*d*) A-I, B-III, C-IV, D-II

44. Match List-I with List-II:

List-I		List-II	
A.	Young's Modulus (Y)	I.	$[M\,L^{-1}T^{-1}]$
B.	Co-efficient of Viscosity (η)	II.	$[M\,L^2T^{-1}]$
C.	Planck's Constant (h)	III.	$[M\,L^{-1}T^{-2}]$
D.	Work Function (ϕ)	IV.	$[M\,L^2T^{-2}]$

Choose the correct answer from the options given below:

(*a*) A-II, B-III, C-IV, D-I (*b*) A-III, B-I, C-II, D-IV

(*c*) A-I, B-III, C-IV, D-II (*d*) A-I, B-II, C-III, D-IV

45. Match List-I with List-II:

List-I (Quantity)		List-II (Dimensional Formula)	
A.	Pressure gradient	I.	$[M^0L^2\,T^{-2}]$
B.	Energy density	II.	$[ML^{-1}T^{-2}]$
C.	Electric field	III.	$[M^1\,L^{-2}T^{-2}]$
D.	Latent heat	IV.	$[M^1\,L^1\,T^{-3}\,A^{-1}]$

Choose the correct answer from the options given below:

(*a*) A-III, B-II, C-I, D-IV (*b*) A.-II, B-III, C-IV, D-I

(*c*) A-III, B-II, C-IV, D-I (*d*) A-II, B-III, C-I, D-IV

46. Match List-I with List-II:

List-I		List-II	
A.	Angular momentum	I.	$[M\,L^2\,T^{-2}]$
B.	Torque	II.	$[ML^{-2}T^{-2}]$
C.	Stress	III.	$[ML^2T^{-1}]$
D.	Pressure gradient	IV.	$[ML^{-1}\,T^{-2}]$

Choose the correct answer from the options given below:

(*a*) A-I, B-IV, C-III, D-II (*b*) A-III, B-I, C-IV, D-II

(*c*) A-II, B-III, C-IV, D-I (*d*) A-IV, B-II, C-I, D-III

47. If L, C and R are the self inductance, capacitance and resistance respectively, which of the following does not have the dimension of time?

(*a*) RC (*b*) L/R (*c*) $\sqrt{LC}$ (*d*) L/C

48. **Assertion (A):** The dimensional formula for product of resistance and conductance is same as for dielectric constant.

Reason (R): Both have dimensions of time constant

(*a*) If both Assertion (A) & Reason (R) are True & the Reason (R) is a correct explanation of the Assertion (A).

(*b*) If both Assertion (A) & Reason (R) are True but Reason (R) is not a correct explanation of the Assertion (A).

(*c*) If Assertion (A) is True but the Reason (R) is False.

(*d*) If both Assertion (A) & Reason (R) are false.

49. The pair of quantities having same dimensions is

(*a*) Impulse and Surface Tension

(*b*) Angular momentum and Work

(*c*) Work and Torque

(*d*) Young's modulus and Energy

50. Which two 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

51. Choose the incorrect statement

(*a*) Solid angle has a unit but no dimensions

(*b*) Relative density has neither unit nor dimensions

(*c*) Universal gravitational constant (G) has a SI unit $Nm^2 kg^{-2}$

(*d*) Reynolds number is having a unit

52. If y = force and x = velocity then dimension of $\frac{dy}{dx}$

(*a*) $[MT^{-1}]$ (*b*) $[LT^{-2}]$

(*c*) $[ML^2T^2]$ (*d*) $[MLT^{-1}]$

53. **Assertion (A):** If x and y are the distances along x and y axes respectively then the dimensions of $\frac{d^3y}{dx^3}$ is $M^0 L^{-2} T^0$.

Reason (R): Dimensions of $\int_a^b y dx$ is $M^0 L^2 T^0$

(*a*) If both Assertion (A) & Reason (R) are True & the Reason (R) is a correct explanation of the Assertion (A).

(*b*) If both Assertion (A) & Reason (R) are True but Reason (R) is not a correct explanation of the Assertion (A).

(*c*) If Assertion (A) is True but the Reason (R) is False.

(*d*) If both Assertion (A) & Reason (R) are false.

54. Fill in the blanks with correct statement, according to given statement

Dimension	(1) _____	(2) _____	(*c*) A physical quantity have dimension	(*d*) A physical quantity does not have dimension
Unit	(*a*) A physical quantity have unit	(*b*) A physical quantity does not have unit	(3) _____	(4) _____

55. A unitless physical quantity may have dimension

(*a*) True (*b*) False

56. A dimensionless physical quantity may be unitless

(*a*) True (*b*) False

57. A physical quantity have unit must have dimension

(*a*) True (*b*) False

58. A physical quantity have dimension may have unit

(*a*) True (*b*) False

59. Select correct options

(*a*) Two physical quantities of different dimensions may have same unit

(*b*) Two physical quantities of different units may have same dimensions

(*c*) Unit less quantities must be dimensionless /

(*d*) Both (*b*) & (*c*)

60. **Assertion (A):** The unit vectors $\hat{i}, \hat{j}$ and $\hat{k}$ have units of distance and dimensions $[M^0L^1T^0]$

Reason (R): The product of a scalar and a vector is a new scalar.

(*a*) If both Assertion (A) & Reason (R) are True & the Reason (R) is a correct explanation of the Assertion (A).

(*b*) If both Assertion (A) & Reason (R) are True but Reason (R) is not a correct explanation of the Assertion (A).

(*c*) If Assertion (A) is True but the Reason (R) is False.

(*d*) If both Assertion (A) & Reason (R) are false.

61. Which of the following is a dimensional constant?

(*a*) Relative density (*b*) Gravitational constant

(*c*) Refractive inbox (*d*) Poisson's ratio

62. The relation between [E] and [B] is

(*a*) [E] = [B][L][T] (*b*) $[E] = [B][L]^{-1}[T]$

(*c*) $[E] = [B][L][T]^{-1}$ (*d*) $[E] = [B][L]^{-1}[T]^{-1}$

63. In the expression $P = El^2m^{-5}G^{-2}$, where E, m, l and G denote energy, mass, angular momentum and gravitational constant, respectively.

The dimensions of P are

(*a*) $[MLT^0]$ (*b*) $[M^2LT^{-1}]$

(*c*) $[M^0L^0T^0]$ (*d*) $[M^0 LT^{-2}]$

64. The pairs of physical quantities that have the same dimensions is/are

I. Volumetric strain and coefficient of friction.

II. Disintegration constant of a radioactive substance and frequency of light wave.

III. Heat capacity and gravitational potential.

IV. Stefan's constant and Wien's constant.

(*a*) I, II and IV (*b*) I, III and IV

(*c*) I, II and III (*d*) I and II

65. Match the following columns.

Column-I		Column-II	
(A)	A physical quantity which has a unit but no dimensions	1.	Gravitational constant
(B)	A physical quantity which has neither unit nor dimensions	2.	Reynold number
(C)	A constant which has a unit	3.	Strain
(D)	A constant which has no unit	4.	Plane angle

(*a*) 4 3 1 2 (*b*) 3 4 2 1

(*c*) 1 2 3 4 (*d*) 1 4 2 3

66. Which of the following physical quantities have the same dimensions?

(*a*) Electric displacement ($\vec{D}$) and surface charge density

(*b*) Displacement current and electric field

(*c*) Current density and surface charge density

(*d*) Electric potential and energy

85. Y = log $e^{\alpha t}$ then find dimension of α?

86. F = 2V – 6t. Find dimension of '2' & '6' Where F is force, V = velocity, t = time

(*a*) Both are dimensionless (*b*) MT^{-1}, MLT^{-3}

(*c*) $ML^{-1}T^{-2}$, MLT^{-3} (*d*) MTT^{-3}, MT^{-1}

87. Force (F) and density (*d*) are related as $F = \frac{\alpha}{\beta + \sqrt{d}}$ Then, the dimensions of α and β are

(*a*) $[M^{3/2}\ L^{-1/2}\ T^{-2}]$, $[ML^{-3}\ T^{0}]$

(*b*) $[M^{3/2}\ L^{-1/2}\ T^{-2}]$, $[M^{1/2}\ L^{-3/2}T^{0}]$

(*c*) $[M^{2}\ L^{2}\ T^{-1}]$, $[ML^{-1}\ T^{-3/2}]$

(*d*) $[MLT^{-2}]$, $[ML^{-2}\ T^{-2/3}]$

88. The force is given in terms of time *t* and displacement *x* by the equation $F = A\cos Bx + C\sin Dt$

The dimensional formula of $\frac{AD}{B}$ is

(*a*) $[M^2L^2T^{-3}]$(*b*) $[M^1L^1T^{-2}]$(*c*) $[ML^2T^{-3}]$(*d*) $[M^0LT^{-1}]$

Dimensional Analysis

89. If force (F), acceleration (*a*) and time *t* is used as a fundamental P.Q. then find dimension of length in terms of them :-

(*a*) $F^0a^1T^2$ (*b*) Fa^2T^2 (*c*) $F\ a^2\ T^0$ (*d*) $F^0\ a\ T$

90. If time (*t*), energy (*E*) and momentum (*P*) taken as base quantities then dimension of mass (*m*), is

(*a*) $m = k\ t^0\ P^2\ E^{-1}$ (*b*) $m = k\ t^0\ P^{-1}\ E^2$

(*c*) $m = k\ t\ P^2\ E$ (*d*) $m = k\ t^0\ P^2\ E$

91. If mass (M), velocity (V) and time (T) are taken as fundamental units, then the dimensions of force (F) are

(*a*) [M V T] (*b*) $[M\ V\ T^{-1}]$

(*c*) $[M^2\ V\ T]$ (*d*) $[M^{-1}V^{-1}T]$

92. The frequency of vibrations *f* of a mass m suspended from a spring of spring constant K is given by a relation of type $f = cm^x K^y$, where *c* is a dimensionless constant. The values of *x* and *y* are

(*a*) $x = \frac{1}{2}, y = \frac{1}{2}$ (*b*) $x = \frac{-1}{2}, y = \frac{-1}{2}$

(*c*) $x = \frac{1}{2}, y = \frac{-1}{2}$ (*d*) $x = \frac{-1}{2}, y = \frac{1}{2}$

93. If force acceleration and time are basic fundamental P.Q. then find dimension of energy

(*a*) $F^2A^{-1}T$ (*b*) $F\ A\ T^2$

(*c*) $F\ A\ T^{-2}$ (*d*) $F\ A^{-1}T$

94. If surface tension (S), moment of inertia (I) and Planck's constant (*h*), were to be taken as the fundamental units, the dimensional formula for linear momentum would be

(*a*) $S^{3/2}[I^{1/2}h^0]$ (*b*) $S^{1/2}[I^{1/2}h^0]$

(*c*) $S^{1/2}[I^{1/2}h^{-1}]$ (*d*) $S^{1/2}[I^{3/2}h^{-1}]$

95. The frequency (*v*) of an oscillating liquid drop may depend upon radius (*r*) of the drop, density (ρ) of liquid and the surface tension (s) of the liquid as: $v = r^a\rho^b s^c$. The values of *a,b* and *c* respectively are

(*a*) $\left(-\frac{3}{2}, -\frac{1}{2}, \frac{1}{2}\right)$ (*b*) $\left(\frac{3}{2}, -\frac{1}{2}, \frac{1}{2}\right)$

(*c*) $\left(\frac{3}{2}, \frac{1}{2}, -\frac{1}{2}\right)$ (*d*) $\left(-\frac{3}{2}, \frac{1}{2}, \frac{1}{2}\right)$

96. The speed of a wave produced in H_2O is given by $v = \lambda^a\ g^b\ \rho^c$, where λ, g, ρ pare wavelength of wave, acceleration due to gravity & density of water respectively. The value of a, b & c respectively are :

(*a*) $\frac{1}{2}, 0, \frac{1}{2}$ (*b*) 1, 1, 0

(*c*) 1, –1, 0 (*d*) $\frac{1}{2}, \frac{1}{2}, 0$

97. If force F, area A and density D are taken as the fundamental units, the representation of Young's modulus 'Y' will be:

(*a*) $[F^{-1}A^{-1}D^{-1}]$ (*b*) $[FA^{-2}D^2]$

(*c*) $[\ FA^{-1}D]$ (*d*) $[FA^{-1}D^0]$

98. If maximum acceleration of oscillating particle is α and maximum velocity is β, then find time period

(*a*) $2\pi\frac{\alpha}{\beta}$ (*b*) $2\pi\alpha\beta$ (*c*) $2\pi\frac{\beta}{\alpha}$ (*d*) $\frac{2\pi\alpha^2}{\beta^2}$

99. Plank's constant (*h*), speed of light in vacuum (*c*) and Newton's gravitational constant (*G*) are three fundamental constants, Which of the following combinations of these has the dimension of length?

(*a*) $\frac{\sqrt{hG}}{c^{3/2}}$ (*b*) $\frac{\sqrt{hG}}{c^{5/2}}$ (*c*) $\sqrt{\frac{hc}{G}}$ (*d*) $\frac{\sqrt{Gc}}{h^{3/2}}$

100. If dimensions of critical velocity v_c of a liquid flowing through a tube are expressed as $\eta^x\ \rho^y\ r^z$ where $\eta\ \rho\ r$ are the coefficient of viscosity of liquid, density of liquid and radius of the tube respectively, then the values of *x,y* and *z* are given by

(*a*) 1,1,1 (*b*) 1, –1,–1

(*c*) –1,–1,1 (*d*) –1,–1,–1

101. If momentum [P], area [A] and time [T] are taken as fundamental quantities, then the dimensional formula for coefficient of viscosity is:

(*a*) $[PA^{-1}T^0]$ (*b*) $[PAT^{-1}]$

(*c*) $[PA^{-1}T]$ (*d*) $[PA^{-1}T^{-1}]$

102. A spherical ball is moving through a viscous medium. If the viscous force acting on the ball is proportional to speed of the ball, then the dimensions of proportionality constant is

(*a*) $[M\ L^{-1}\ T^{-1}]$ (*b*) $[M\ L^{-2}\ T^{-1}]$

(*c*) $[M\ L\ T^{-2}]$ (*d*) $[M\ L^0\ T^{-1}]$

103. Force acting on object is proportional to squre of velocity then find dimensions of proportional constant.

104. A physical quantity of the dimensions of length that can be formed out of c, G and $\frac{e^2}{4\pi\varepsilon_0}$ is c. is velocity of light, G is universal constant of gravitation and θ is charge]

(*a*) $\frac{1}{c^2}\left[G\frac{e^2}{4\pi\varepsilon_0}\right]^{1/2}$ (*b*) $c^2\left[G\frac{e^2}{4\pi\varepsilon_0}\right]^{1/2}$

(*c*) $\frac{1}{c^2}\left[\frac{e^2}{G4\pi\varepsilon_0}\right]^{1/2}$ (*d*) $\frac{1}{c}G\frac{e^2}{4\pi\varepsilon_0}$

105. The speed of light C gravitational constant G and plant constant h are taken as fundamental P.Q then the dimension of time in the new system of unit

(*a*) $G^{+1/2}\,h^{1/2}\,C^{-5/2}$ (*b*) $G^{-1/2}\,h^{1/2}\,C^{-1/2}$

(*c*) $G^{1/2}\,h^{1/2}\,C^{3/2}$ (*d*) $G^{-1/2}\,h^{-1/2}\,C^{-1/2}$

106. In a new system of units energy (E), density (d) and power (P) are taken as fundamental units, then the dimensional formula of universal gravitational constant G will be

(*a*) $[E^{-1}d^{-2}P^2]$ (*b*) $[E^{-1}d^{-1}P^2]$

(*c*) $[E^2\,d^{-1}\,P^{-1}]$ (*d*) $[E^1\,d^{-2}\,P^{-2}]$

107. Let us consider a system of units in which mass and angular momentum are dimensionless. If length has dimension of *L*, which of the following statement (*s*) is/are correct?

(*a*) The dimension of force is L^{-3}

(*b*) The dimension of energy of L^{-2}

(*c*) The dimension of power is L^{-5}

(*d*) The dimension of linear momentum is L^{-1}

108. Young's modulus of elasticity *Y* is expressed in terms of three derived quantities, namely, the gravitational constant *G*. Planck's constant *h* and the speed of light *c*, as $Y = c^{\alpha}h^{\beta}G^{\gamma}$ Which of the following is the correct option?

(*a*) $\alpha = 7, \beta = -1, \gamma = -2$ (*b*) $\alpha = -7, \beta = -1, \gamma = -2$

(*c*) $\alpha = 7, \beta = -1, \gamma = -2$ (*d*) $\alpha = -7, \beta = 1, \gamma = -2$

109. Velocity (*v*) and acceleration (*a*) in two systems of units 1 and 2 are related as respectively. Here *m* and *n* are constants. The relations for distance and time in two systems respectively are:

(*a*) $\frac{n^3}{m^3}L_1 = L_2$ and $\frac{n^2}{m}T_1 = T_2$

(*b*) $L_1 = \frac{n^4}{m^2}L_2$ and $T_1 = \frac{n^2}{m}T_2$

(*c*) $L_1 = \frac{n^2}{m}L_2$ and $T_1 = \frac{n^4}{m^2}T_2$

(*d*) $\frac{n^2}{m}L_1 = L_2$ and $\frac{n^4}{m^2}T_1 = T_2$

110. Consider the efficiency of Carnot's engine is given by $\eta = \frac{\alpha\beta}{\sin\theta}\log_e\frac{\beta x}{kT}$ where α and β are constants. If *T* is temperature, *k* is Boltzman constant, θ is angular displacement and *x* has the dimensions of length. Then, choose the incorrect option

(*a*) Dimensions of β is same as that of force

(*b*) Dimensions of $\alpha^{-1}x$ is same as that of energy

(*c*) Dimensions of $\eta^{-1}\sin\theta$ theta is same as that of αβ

(*d*) Dimensions of α is same as that of β

111. If *E* and *H* represents the intensity of electric field and magnetising field respectively, then the unit of *E/H* will be:

(*a*) Joule (*b*) Newton

(*c*) Ohm (*d*) Mho

112. A physical quantity $\vec{S}$ is defined as $\vec{S} = \left(\vec{E} \times \vec{B}\right)/\mu_0$, where $\vec{E}$ is electric field, $\vec{B}$ is magnetic field and μ_0 is the permeability of free space. The dimensions of $\vec{S}$ are the same as the dimensions of which of the following quantity (ies)?

(*a*) $\frac{\text{Energy}}{\text{Charge} \times \text{Current}}$ (*b*) $\frac{\text{Force}}{\text{Length} \times \text{Time}}$

(*c*) $\frac{\text{Energy}}{\text{Volume}}$ (*d*) $\frac{\text{Power}}{\text{Area}}$

113. Identify the pair of physical quantities that have same dimensions:

(*a*) Velocity gradient and decay constant

(*b*) Wien's constant and Stefan constant

(*c*) Angular frequency and angular momentum

(*d*) Wave number and Avogadro number

114. Which of the following physical quantities have the same dimensions?

(*a*) Electric displacement ($\vec{D}$) and surface charge density

(*b*) Displacement current and electric field

(*c*) Current density and surface charge density

(*d*) Electric potential and energy

115. Which of the following is not a dimensionless quantity?

(*a*) Relative magnetic permeability (μr)

(*b*) Power factor

(*c*) Quality factor

(*d*) Permeability of free space (μ_0)

116. Which of the following combinations has the dimension of electrical resistance (Σ_0 is the permittivity of vacuum and μ_0 is the permeability of vacuum)?

(*a*) $\sqrt{\frac{\epsilon_0}{\mu_0}}$ (*b*) $\frac{\mu_0}{\epsilon_0}$ (*c*) $\frac{\epsilon_0}{\mu_0}$ (*d*) $\sqrt{\frac{\mu_0}{\epsilon_0}}$

117. Dimensional formula for thermal conductivity is (here *K* denotes the temperature):

(*a*) $MLT^{-3}\,K^{-1}$ (*b*) $MLT^{-2}\,K^{-2}$

(*c*) MLT–2 K (*d*) $MLT^{-3}\,K$

118. Amount of solar energy received on the earth's surface per unit area per unit time is defined a solar constant. Dimension of solar constant is

(*a*) ML^2T^{-2} (*b*) MLT^{-2}

(*c*) $M^2L^0T^{-1}$ (*d*) ML^0T^{-3}

Limitation of Dimensional Analysis

119. Which of the following equation can be derived dimensionally??

(*a*) $s = vt - \frac{1}{2}at^2$ (*b*) $v^2 = u^2 \times 2as$

(*c*) $h = \frac{\omega^2 r^2}{2g}$ (*d*) $v = \frac{d}{t}$

120. The method of dimensions cannot be applied to derive the formula for physical quantity which depends on

(*a*) Two different physical quantities

(*b*) Three physical quantities in which two have same dimensions

(*c*) More than three physical quantities

(*d*) Both (*b*) & (*c*)

121. Which of the following equation can not be derived dimensionally

(*a*) $F = 6\pi r\eta$ (*b*) $\theta = \omega t$

(*c*) $\frac{d\theta}{dt} = \rho Av$ (*d*) $P = \rho gh$

122. Fill in the blanks with correct statement, according to given statement

Physically correctness	(1) _____	(2) _____	(*c*) Equation is physically wrong	(*d*) Equation is physically correct
Dimensional correctness	(*a*) Equation is dimensional wrong	(*b*) Equation is dimensional correct	(3) _____	(4) _____

123. A student when discussing the properties of medium writes velocity of light in vacuum = velocity of light in medium. This formula is

(*a*) Dimensionally correct (*b*) Dimensionally incorrect

(*c*) Numerically incorrect (*d*) Both (*a*) and (*c*)

124. **Assertion (A):** Work = Torque is dimensionally correct but not physically.

Reason (R): Dimensional correctness of an equation ensures its physical correctness)

(*a*) If both Assertion (A) & Reason (R) are True & the Reason (R) is a correct explanation of the Assertion (A).

(*b*) If both Assertion (A) & Reason (R) are True but Reason (R) is not a correct explanation of the Assertion (A).

(*c*) If Assertion (A) is True but the Reason (R) is False.

(*d*) If both Assertion (A) & Reason (R) are false.

Significant Digits

125. Give the number of significant figures in each measurement.

(*i*) 60.36.7 m (*ii*) 0.006606 s

(*iii*) 61.2.002 kg (*iv*) 306,490,000 people

126. The number of significant figures in 3.04×10^{23} is:

(*a*) 2 (*b*) 3 (*c*) 23 (*d*) 25

127. The number of significant figures in 0.01020 is:

(*a*) 1 (*b*) 2 (*c*) 3 (*d*) 4

128. Match the list -I with List-II

List-I		List-II	
(I)	1001	(A)	3
(II)	010.1	(B)	4
(III)	100.100	(C)	5
(IV)	0.0010010	(D)	6

129. Given $P = 0.0030\ m$, $Q = 2.40$ m and $R = 3000\ m$, the number of significant figures in P, Q, R are respectively :

(*a*) 1, 2, 1 (*b*) 2, 3, 1

(*c*) 4, 2, 1 (*d*) 4, 2, 4

130. How many significant figures should the answer to this calculation contain? $= \frac{1.014 + 0.07}{5.11}$

(*a*) 2 (*b*) 3 (*c*) 4 (*d*) 1

131. Add these three length : $l_1 = 0.307$m, 0.52 m and 0.4 m

(*a*) 1.22 m (*b*) 1.2 m

(*c*) 1.3 m (*d*) 1.7 m

132. Number of significant digit in the result of $\frac{4.327}{2.515}$ m.

(*a*) 2 (*b*) 4 (*c*) 3 (*d*) 5

133. Taking into account of significant digit. What is the value of 9.99 m – 0.0099 m.

(*a*) 9.98 m (*b*) 9.890 m

(*c*) 9.9 m (*d*) 9.9801 m

134. Express the final answer to the proper number of significant figures.

(i) 101.2 + 18.702 = ?

(ii) 202.88 – 1.013 = ?

135. $\frac{1.5}{1.5}$ is equal to

(*a*) 1 (*b*) 1.0 (*c*) 1.00 (*d*) 1.000

136. When 96.54 is divided by 2.40, the correct result is:

(*a*) 40.2250 (*b*) 4.0225

(*c*) 40.23 (*d*) 40.2

137. Which of the following reading is most accurate?

(*a*) 2.4 m (*b*) 2.41 m (*c*) 2 m (*d*) 2.413 m

138. For greater accuracy, the quantity with higher power should have least error.

(*a*) True (*b*) False

Statement II: A screw gauge having a smaller value of pitch has greater accuracy.

In the light of the above statements, choose the most appropriate answer from the options given below:

(*a*) Both statement I and statement II are correct

(*b*) Statement I is correct and statement II is incorrect

(*c*) Statement I is incorrect and statement II is correct.

(*d*) Both statements I and statements II are incorrect

179. Match the quantities in column –I to dimensions in column-II. R is resistance, L is inductance, C is capacitance, H is latent heat and S is specific heat.

Column-I		Column-II	
(A)	LC	(p)	L^2T^{-2}
(B)	LR	(q)	$L^2T^{-2}K^{-1}$
(C)	H	(r)	T^2
(D)	S	(s)	$M^2L^4T^{-5}A^{-4}$

(*a*) A→r, B→s, C→p, D→q (*b*) A→s, B→p ,C→r, D→q

(*c*) A→p, B→s,C→r, D→q (*d*) A→q, B→s,C→r, D→q

Vernier Caliper

180. In certain vernier callipers, 25 divisions on the vernier scale have the same length as 24 divisions on the main scale. One division on the main scale is 1 mm long. The least count of the instrument is

(*a*) 0.04 mm (*b*) 0.01 mm (*c*) 0.02 mm (*d*) 0.08 mm

181. In a Vernier calliper, one main scale division is x cm and n division of Vernier scale coincide with $(n-1)$ division of the main scale. The least count of the Vernier caliper in cm is:

(*a*) $\left(\frac{n-1}{n}\right)x$ (*b*) $\frac{nx}{(n-1)}$ (*c*) $\frac{x}{n}$ (*d*) $\frac{x}{n-1}$

182. The main scale of a Vernier callipers has n divisions/cm. n divisions of the Vernier scale coincide with $(n-1)$ divisions of main scale. The least count of the Vernier callipers is

(*a*) $\frac{1}{(n+1)(n-1)}$ cm (*b*) $\frac{1}{n}$ cm

(*c*) $\frac{1}{n^2}$ cm (*d*) $\frac{1}{n(n+1)}$ cm

183. One cm on the main scale of vernier callipers is divided into ten equal parts. If 20 divisions of vernier scale coincide with 8 small divisions of the main scale. What will be the least count of callipers?

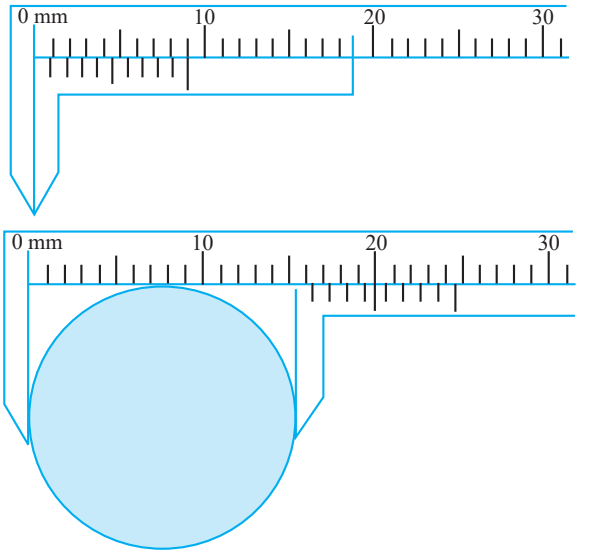
184. A hypothetical Vernier scale of a travelling microscope has 40 divisions which is equal to 38 main scale divisions. If each main scale division is 1.2 mm, then minimum error in the measurement of length is

(*a*) 0.6 mm (*b*) 1.2 mm

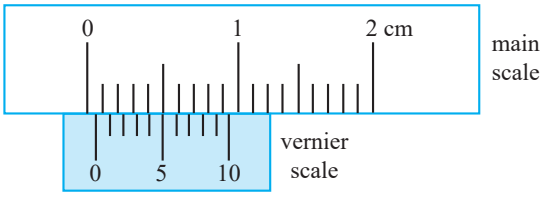
(*c*) 0.06 mm (*d*) 0.1 mm

Reading on Vernier Calliper

185. In the given Vernier scale, 10 divisions of the vernier scale is matching with 9 divisions of the main scale as shown in the first figure. Find the diameter of the object in the second figure. Assume the edge of the vernier as '0' of the verrnier.



186. Find the zero correction in the given figure.



(*a*) 0.4 mm (*b*) 0.5 mm

(*c*) –0.5 mm (*d*) –0.4 mm

187. The least count of the main scale of a vernier calipers is 1 mm. Its vernier scale is divided into 10 divisions and coincide with 9 divisions of the main scale. When jaws are touching each other, the 7^{th} division of vernier scale coincides with a division of main scale and the zero of vernier scale is lying right side of the zero of main scale. When this vernier is used to measure length of cylinder the zero of the vernier scale between 3.1 cm and 3.2 cm and 4^{th} VSD coincides with a main scale division. The length of the cylinder is (VSD is vernier scale division)

(*a*) 2.99 cm (*b*) 3.07 cm

(*c*) 3.21 cm (*d*) 3.2 cm

Screw Gauge

188. A screw gauge has least count of 0.01 mm and there arc 50 divisions in its circular scale. The pitch of the screw gauge is

(*a*) 0.01 mm (*b*) 0.25 mm (*c*) 0.5 mm (*d*) 1.0 mm

189. A screw gauge has 50 divisions on its circular scale. The circular scale is 4 units ahead of the pitch scale marking, prior to use. Upon one complete rotation of the circular scale, a displacement of 0.5 mm is noticed on the pitch scale. The nature of zero error involved and the least count of the screw gauge, are respectively:

(*a*) Positive, 0.1 mm (*b*) Positive, 0.1 μm

(*c*) Positive, 10 μm (*d*) Negative, 2 μm

190. **Assertion (A):** If in five complete rotations of the circular scale, the distance travelled on main scale of the screw gauge is 5 mm and there are 50 total divisions on circular scale, then least count is 0.001 cm.

Reason (R):

$$\text{Least Count} = \frac{\text{Pitch}}{\text{Total divisions on circular sclae}}$$

In the light of the above statements, choose the most appropriate answer from the options given below :

(*a*) Assertion (A) is not correct but Reason (R) is correct.

(*b*) Both Assertion (A) and Reason (R) are correct and Reason (R) is the correct explanation of Assertion (A).

(*c*) Assertion (A) is correct but Reason (R) is not correct.

(*d*) Both Assertion (A) and Reason (R) are correct and Reason (R) is NOT the correct explanation of Assertion (A)

Reading on Screw Guage

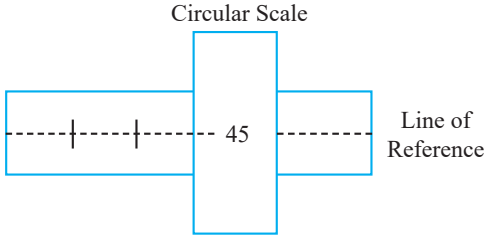
191. A student measured the diameter of a small steel ball using a screw gauge of least count 0.001 cm. The main scale reading is 5 mm and zero of circular scale division coincides with 25 divisions above the reference level. If screw gauge has a zero error of –0.004 cm, the correct diameter of the ball is

(*a*) 0.521 cm (*b*) 0.525 cm (*c*) 0.053 cm (*d*) 0.529 cm

192. Two full turns of the circular scale of gauge cover a distance of 1 mm on scale. The total number of divisions on circular scale is 50. Further, it is found that 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 division 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

193. Consider a screw gauge without any zero error. What will be the final reading corresponding to the final state as shown? It is given that the circular head translates P MSD in N rotations. One MSD is equal to 1 mm.



The circular scale has 100 divisions

(*a*) $\left(\frac{P}{N}\right)\left(2+\frac{45}{100}\right)$ mm (*b*) $\left(\frac{N}{P}\right)\left(2+\frac{45}{N}\right)$ mm

(*c*) $P\left(\frac{2}{N}+\frac{45}{100}\right)$ mm (*d*) $\left(2+\frac{45}{100}\times\frac{P}{N}\right)$ mm

194. There are 100 divisions on the circular scale of a screw gauge of pitch 1 mm. With no measuring quantity in between the jaws, the zero of the circular scale lies 5 divisions below the reference line. The diameter of a wire is then measured using this screw gauge. It is found the 4 linear scale divisions are clearly visible while 60 divisions on circular scale coincide with the reference line. The diameter of the wire is:

(*a*) 4.65 mm (*b*) 4.55 mm (*c*) 4.60 mm (*d*) 3.35 mm

Types of Error

195. Zero error of an instrument introduces:

(*a*) Systematic errors (*b*) Random errors

(*c*) Both (*d*) None

196. **Assertion (A):** In Vernier caliper, if positive zero error exists, then while taking measurements the reading taken will be more than actual Reading.

Reason (R): The Zero error in Vernier caliper might have happened due to manufacturing defect or due to rough handling.

(*a*) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).

(*b*) Both Assertion (A) and Reason (R) are true but Reason (R) is NOT the correct explanation of Assertion (A).

(*c*) Assertion (A) is true but Reason (R) is false.

(*d*) Assertion (A) is false but Reason (R) is true.

197. In 5 number of observation systematic error is 12% then find error in 20 observation?

198. In 5 number of observation random error is 12% then find error in 20 observation?

199. Given below are two statements:

Statement I: Absolute error is unitless and dimensionless.

Statement II: All types of errors are unitless and dimensionless.

In the light of the above statements, choose the most appropriate

answer from the options given below:

(*a*) Both statement I and statement II are correct

(*b*) Statement I is correct and statement II is incorrect.

(*c*) Statement I is incorrect and statement II is correct

(*d*) Both statements I and statements II are incorrect.

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Direction: In the questions given below, the first statement is given as Assertion(A) and other as Reason(R). for each questions, choose correct option from the following

(*a*) If both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).

(*b*) If both Assertion (A) and Reason (R) are true but Reason (R) is not the correct explanation of Assertion (A).

(*c*) If Assertion (A) is true but Reason (R) is false.

(*d*) If both Assertion (A) and Reason (R) are false.

1. **Assertion (A):** Force can be added to pressure.
   Reason (R): Force and pressure have same dimensions.
2. **Assertion (A):** Both velocity and speed have same dimensions.
   Reason (R): Velocity cannot be added to speed.
3. **Assertion (A):** The given equation $x = x_0 + u_0t + 1/2\ at^2$ is dimensionally correct, where x is the distance travelled by a particle in time t, initial position x_0 initial velocity u_0 and uniform acceleration a is along the direction of motion.
   Reason (R): Dimensional analysis can be used for checking the dimensional consistency or homogeneity of the equation.
4. **Assertion (A):** Mass, length and time are fundamental physical quantities.
   Reason (R): They are independent of each other.
5. **Assertion (A):** Density is a derived physical quantity.
   Reason (R): Density cannot be derived from the fundamental physical quantities.
6. **Assertion (A):** When we change the unit of measurement of a quantity, its numerical value changes.
   Reason (R): Smaller the unit of measurement, smaller is its numerical value.
7. **Assertion (A):** L/R and CR both have the same dimensions.
   Reason (R): L/R and CR both have the dimension of time.
8. **Assertion (A):** A screw gauge having a smaller value of pitch has greater accuracy.
   Reason (R): The least count of screw gauge is directly propor- tional to the number of divisions on circular scale.
9. **Assertion (A):** All unitless quantities are dimensionless.
   Reason (R): Dimensions are exponent raised to fundamental units in derived units.
10. **Assertion (A):** Power of an engine depends on mass, angular speed, torque and angular momentum, so the formula of power is not derived with the help of dimensional method.
    Reason (R): In mechanics, if a particular quantity depends on more than three quantities, then we cannot derive the formula of the quantity by the help of dimensional method.
11. **Assertion (A):** Temperature cannot be expressed as a derived quantity in terms of length and mass.
    Reason (R): Temperature is a fundamental quantity.
12. **Assertion (A):** Quality factor is dimensionless.
    Reason (R): Quality factor depends on resistance, inductance and capacitance of LCR series circuit.
13. **Assertion (A):** The unit of EMF is Joule/Coulomb.
    Reason (R): EMF is an electromagnetic force.
14. **Assertion (A):** A physical quantity is measured and its value is always found to be nu; where n is the numerical value and u is the unit.
    Reason (R): $n \propto \frac{1}{u}$
15. **Assertion (A):** The random error in the arithmetic mean of 100 observations is x; then random error in the arithmetic mean of 400 observations would be $x/4$.
    Reason (R): Arithmetic mean of the magnitudes of absolute errors in n measurements of the quantity is represented by
    $\overline{\Delta a} = \frac{|\Delta a_1| + |\Delta a_2| + ... + |\Delta a_n|}{n}$
16. **Assertion (A):** Systematic error can be minimised.
    Reason (R): Systematic error can be calculated.
17. **Assertion (A):** 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 0.11 s.
    Reason (R): Mean absolute error
    $= \frac{\text{Sum of absolute errors}}{\text{Numbers of observations}}$
18. **Assertion (A):** Measurement's precision is determined by least count of measuring instrument.
    Reason (R): Smaller the least count, more is the precision
19. **Assertion (A):** Specific gravity of liquid is dimensionless.
    Reason (R): It is the ratio of density of liquid to density of water.
20. **Assertion (A):** Methods of dimensions cannot be used for deriving formula containing trigonometric ratios.
    Reason (R): Trigonometric ratios have no dimensions.
21. **Assertion (A):** Both plane and solid angles are fundamental units.
    Reason (R): Both have the same units.
22. **Assertion (A):** Astronomical unit is a unit for measuring large distances.
    Reason (R): It is the distance covered by light in one year.

Answer Key

1. (*a*) **2.** (*d*) **3.** (*e*) **4.** (*a*) **5.** (*d*) **6.** (*b*) **7.** (*b*) **8.** (*a*) **9.** 2500 m/s

10. (*c*) **11.** (*b*) **12.** (*a*) **13.** (*b*) **14.** (*a*) **15.** (*a*) **16.** (*c*) **17.** (*c*) **18.** (*b*) **19.** (*a*)

20. (*d*) **21.** (*d*) **22.** (*c*) **23.** (*c*) **24.** (*d*) **25.** (*a*) **26.** (*c*) **27.** (*a*) **28.** $ML^{-1}T^{2}$ **29.** $ML^{2}T^{-3}A^{-2}$

30. $ML^{2}T^{-2}A^{-2}$ **31.** $MLT^{-2}A^{-2}$ **32.** $MT^{-2}A^{-1}$, $ML^{2}T^{-2}A^{-1}$ **33.** $ML^{-1}T^{-1}$ **34.** (*c*) **35.** (*d*)

36. (*a*) **37.** (*a*) **38.** (*a*) **39.** (*a*) **40.** (*c*) **41.** (*a*) **42.** (*d*) **43.** (*b*) **44.** (*b*) **45.** (*c*)

46. (*b*) **47.** (*d*) **48.** (*c*) **49.** (*c*) **50.** (*a*) **51.** (*d*) **52.** (*a*) **53.** (*b*) **54.** (1) May have dimension/may be dimensionless, (2) Must be dimensionless/does not have dimension, (3) Must have unit, (4) May or may not have unit

55. (*b*) **56.** (*a*) **57.** (*b*) **58.** (*b*) **59.** (*d*) **60.** (*d*) **61.** (*b*) **62.** (*c*) **63.** (*c*) **64.** (*d*)

65. (*a*) **66.** (*a*) **67.** (*d*) **68.** (*b*) **69.** $a = MLT^{-3}$, $b = MLT^{-4}$ **70.** $A = LT^{-1}$, $B = T^{-1}$ **71.** (*b*)

72. (*c*) **73.** (*b*) **74.** (*b*) **75.** (*b*) **76.** (*a*) **77.** $\beta = L^{-1}$, $\alpha = T^{-1}$ **78.** (*a*) **79.** (*d*)

80. $\alpha = [MLT^{-2}]$, $\beta = [M^{0}L^{0}T^{0}]$, $\gamma = [L^{-1}]$ **81.** (*b*) **82.** $A = L^{1}$, $k = L^{-1}$, $\omega = T^{-1}$ **83.** (*b*) **84.** (*a*)

85. $\alpha = T^{-1}$ **86.** (*b*) **87.** (*b*) **88.** (*c*) **89.** (*a*) **90.** (*a*) **91.** (*b*) **92.** (*d*) **93.** (*b*) **94.** (*b*)

95. (*a*) **96.** (*d*) **97.** (*d*) **98.** (*c*) **99.** (*a*) **100.** (*b*) **101.** (*a*) **102.** (*d*) **103.** (*d*) **104.** (*a*)

105. (*a*) **106.** (*b*) **107.** (*a,b,d*) **108.** (*a*) **109.** (*a*) **110.** (*d*) **111.** (*c*) **112.** (*b, d*) **113.** (*a*) **114.** (*a*)

115. (*d*) **116.** (*d*) **117.** (*a*) **118.** (*d*) **119.** (*d*) **120.** (*d*) **121.** (*a*) **122.** (1) Must be physically wrong, (2) May or amy not physically correct, (3) May or may be dimensionally correct (4)Must be dimensionally correct $S_n = u + \frac{a}{2}(2n-1)$ (S_nth → dimensionally correct becouse it is displacement in one sec.) **123.** (*d*) **124.** (*c*)

125. (i) 3, (ii) 4, (iii) 4, (iv) infinite. **126.** (*b*) **127.** (*d*) **128.** I-B, II-A, III-D, IV-C **129.** (*b*) **130.** (*b*)

131. (*b*) **132.** (*b*) **133.** (*a*) **134.** (i) 119.9 (ii) 201.87 **135.** (*b*) **136.** (*d*) **137.** (*d*) **138.** (*a*) **139.** (*a*)

140. (*a*) **141.** (*a*) **142.** (*a*) **143.** (*a*) **144.** (i) 2.62, (ii) 0.01, 0.06, 0.2, 0.09, 0.18, (iii) 0.11, (iv) 0.042, (iv) 4.2%

145. (*a*) **146.** 1% **147.** (*a*)

148. (*d*) **149.** (*c*) **150.** 5% **151.** (*b*) **152.** (i) $\frac{\Delta x}{x} = \frac{0.6}{30}$, (ii) $\frac{\Delta y}{y} = \frac{0.6}{10}$, (iii) $\frac{\Delta z}{z} = \left(\frac{0.5}{20} + \frac{0.1}{10}\right)$, (iv) $\frac{\Delta m}{m} = \frac{7}{200}$

153. (*a*) **154.** (*c*) **155.** (*a*) **156.** sum = (50 ± 0.7)°C, Difference = (30 ± 0.7)°C **157.** (*c*) **158.** (*d*) **159.** (*d*)

160. (*d*) **161.** (*d*) **162.** (*b*) **163.** (*b*) **164.** (*b*) **165.** (*d*) **166.** 10.1% **167.** (*b*) **168.** (*c*) **169.** (*a*)

170. $\frac{\pi}{\sqrt{3}}\%$ **171.** 45° **172.** 10% **173.** 125% **174.** (I) (150 ± 6) Ω, (II) (33.1 ± 3.1) Ω **175.** (*b*)

176. (1) Vernier Calliper, (2) screw gauge, (3) metre scale, (4) Vernier Calliper, (5) Vernier Calliper, (6) screw gauge, (7) screw gauge 14

177. (*d*) **178.** (*c*) **179.** (*a*) **180.** (*a*) **181.** (*c*) **182.** (*c*) **183.** 12/20 **184.** (*c*) **185.** 15.6 mm

186. (*b*) **187.** (*b*) **188.** (*c*) **189.** (*c*) **190.** (*a*) **191.** (*d*) **192.** (*d*) **193.** (*d*) **194.** (*b*)

195. (*a*) **196.** (*b*) **197.** 12% **198.** 3% **199.** (*d*)

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1. (*d*) **2.** (*b*) **3.** (*a*) **4.** (*a*) **5.** (*c*) **6.** (*c*) **7.** (*a*) **8.** (*c*) **9.** (*b*) **10.** (*a*)

11. (*a*) **12.** (*b*) **13.** (*b*) **14.** (*a*) **15.** (*b*) **16.** (*d*) **17.** (*a*) **18.** (*a*) **19.** (*a*) **20.** (*a*)

21. (*d*) **22.** (*d*)

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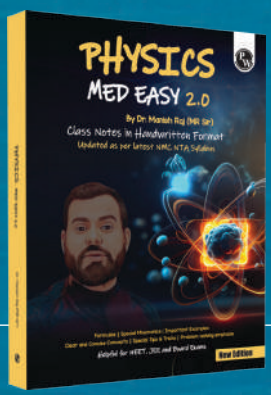

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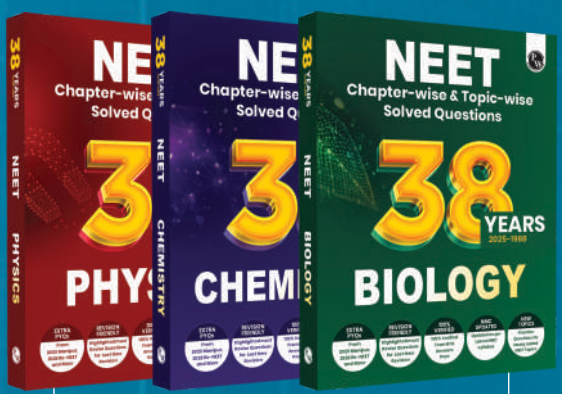

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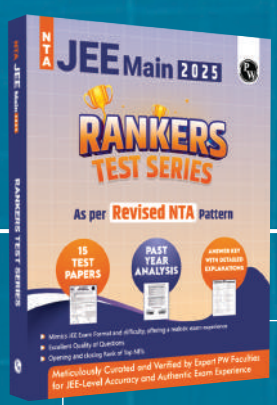

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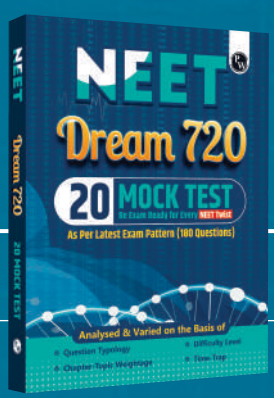

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