112. Dimensions of charge are **[DPMT 2002]**

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

(c) $T^{-1} A$ (d) TA

113. According to Newton, the viscous force acting between liquid layers of area A and velocity gradient $\Delta v/\Delta z$ is given by $F = -\eta A\frac{\Delta v}{\Delta z}$ where η is constant called coefficient of viscosity. The dimension of η are **[JIPMER 2001, 02]**

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

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

114. Identify the pair whose dimensions are equal **[AIEEE 2002]**

(a) Torque and work (b) Stress and energy

(c) Force and stress (d) Force and work

115. The dimensions of pressure is equal to **[AIEEE 2002]**

(a) Force per unit volume

(b) Energy per unit volume

(c) Force

(d) Energy

116. Which of the two have same dimensions **[AIEEE 2002]**

(a) Force and strain

(b) Force and stress

(c) Angular velocity and frequency

(d) Energy and strain

117. 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 **[Orissa JEE 2002]**

(a) $ML^{-1} T^{-1}$ (b) MLT^{-1}

(c) $M^0 LT^{-1}$ (d) $ML^0 T^{-1}$

118. The dimensions of emf in MKS is **[CPMT 2002]**

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

(c) $MLT^{-2} Q^{-1}$ (d) $ML^2 T^{-2} Q^{-1}$

119. Which of the following quantities is dimensionless **[MP PET 2002]**

(a) Gravitational constant (b) Planck's constant

(c) Power of a convex lens (d) None

120. The dimensional formula for Boltzmann's constant is **[MP PET 2002; Pb. PET 2001]**

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

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

121. The dimensions of K in the equation $W = \frac{1}{2} Kx^2$ is **[Orissa JEE 2003]**

(a) $M^1 L^0 T^{-2}$ (b) $M^0 L^1 T^{-1}$

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

122. The physical quantities not having same dimensions are **[AIEEE 2003]**

(a) Speed and $(\mu_0\varepsilon_0)^{-1/2}$

(b) Torque and work

(c) Momentum and Planck's constant

(d) Stress and Young's modules

123. Dimension of R is **[AFMC 2003; AIIMS 2005]**

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

(c) $ML^{-1} T^{-2}$ (d) None of these

124. The dimensional formula of relative density is **[CPMT 2003]**

(a) ML^{-3} (b) LT^{-1}

(c) MLT^{-2} (d) Dimensionless

125. The dimensional formula for young's modulus is **[BHU 2003; CPMT 2004]**

(a) $ML^{-1} T^{-2}$ (b) $M^0 LT^{-2}$

(c) MLT^{-2} (d) $ML^2 T^{-2}$

126. Frequency is the function of density (ρ), length (a) and surface tension (T). Then its value is **[BHU 2003]**

(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) $k\rho^{1/2} a^{1/2}/T^{3/2}$

127. The dimensions of electric potential are **[UPSEAT 2003]**

(a) $[ML^2 T^{-2} Q^{-1}]$ (b) $[MLT^{-2} Q^{-1}]$

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

128. Dimensions of potential energy are **[MP PET 2003]**

(a) MLT^{-1} (b) $ML^2 T^{-2}$

(c) $ML^{-1} T^{-2}$ (d) $ML^{-1} T^{-1}$

129. The dimension of $\frac{R}{L}$ are **[MP PET 2003]**

(a) T^2 (b) T

(c) T^{-1} (d) T^{-2}

130. The dimensions of shear modulus are **[MP PMT 2004]**

(a) MLT^{-1} (b) $ML^2 T^{-2}$

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

131. Pressure gradient has the same dimension as that of **[AFMC 2004]**

(a) Velocity gradient (b) Potential gradient

(c) Energy gradient (d) None of these

132. If force (F), length (L) and time (T) are assumed to be fundamental units, then the dimensional formula of the mass will be **[J & K CET 2004]**

(a) $FL^{-1}T^{2}$ (b) $FL^{-1}T^{-2}$

(c) $FL^{-1}T^{-1}$ (d) $FL^{2}T^{2}$

133. The dimensions of universal gas constant is **[Pb. PET 2003]**

(a) $[ML^{2}T^{-2}\theta^{-1}]$ (b) $[M^{2}LT^{-2}\theta]$

(c) $[ML^{3}T^{-1}\theta^{-1}]$ (d) None of these

134. In the relation $y = a\cos(\omega t - kx)$, the dimensional formula for k is **[BHU 2004]**

(a) $[M^{0}L^{-1}T^{-1}]$ (b) $[M^{0}LT^{-1}]$

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

135. Position of a body with acceleration 'a' is given by $x = Ka^{m}t^{n}$, here t is time. Find dimension of m and n. **[Orissa JEE 2005]**

(a) $m = 1,\ n = 1$ (b) $m = 1,\ n = 2$

(c) $m = 2,\ n = 1$ (d) $m = 2,\ n = 2$

136. "Pascal-Second" has dimension of **[AFMC 2005]**

(a) Force (b) Energy

(c) Pressure (d) Coefficient of viscosity

137. In a system of units if force (F), acceleration (A) and time (T) are taken as fundamental units then the dimensional formula of energy is **[BHU 2005]**

(a) $FA^{2}T$ (b) FAT^{2}

(c) $F^{2}AT$ (d) FAT

138. Out of the following pair, which one does not have identical dimensions **[AIEEE 2005]**

(a) Moment of inertia and moment of force

(b) Work and torque

(c) Angular momentum and Planck's constant

(d) Impulse and momentum

139. The ratio of the dimension of Planck's constant and that of moment of inertia is the dimension of **[CBSE PMT 2005]**

(a) Frequency (b) Velocity

(c) Angular momentum (d) Time

140. Which of the following group have different dimension **[IIT JEE 2005]**

(a) Potential difference, EMF, voltage

(b) Pressure, stress, young's modulus

(c) Heat, energy, work-done

(d) Dipole moment, electric flux, electric field

141. Out of following four dimensional quantities, which one quantity is to be called a dimensional constant **[KCET 2005]**

(a) Acceleration due to gravity

(b) Surface tension of water

(c) Weight of a standard kilogram mass

(d) The velocity of light in vacuum

142. Density of a liquid in CGS system is 0.625 g/cm^{3}. What is its magnitude in SI system **[J&K CET 2005]**

(a) 0.625 (b) 0.0625

(c) 0.00625 (d) 625

Errors of Measurement

1. The period of oscillation of a simple pendulum is given by $T = 2\pi\sqrt{\frac{l}{g}}$ 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 in g is

(a) 0.1% (b) 1%

(c) 0.2% (d) 0.8%

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

(a) 11% (b) 8%

(c) 5% (d) 1%

3. 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) $\frac{1}{4}x$

(c) $2x$ (d) $\frac{1}{2}x$

4. What is the number of significant figures in 0.310×10^3

(a) 2 (b) 3

(c) 4 (d) 6

5. Error in the measurement of radius of a sphere is 1%. The error in the calculated value of its volume is **[AFMC 2005]**

(a) 1% (b) 3%

(c) 5% (d) 7%

6. 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) $(2.00 \pm 0.10)\ s$

7. A body travels uniformly a distance of $(13.8 \pm 0.2)\ m$ in a time (4.0 ± 0.3) s. The velocity of the body within error limits is

(a) $(3.45 \pm 0.2)\ ms^{-1}$ (b) $(3.45 \pm 0.3)\ ms^{-1}$

(c) $(3.45 \pm 0.4)\ ms^{-1}$ (d) $(3.45 \pm 0.5)\ ms^{-1}$

8. The percentage error in the above problem is

(a) 7% (b) 5.95%

(c) 8.95% (d) 9.85%

9. 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

10. The decimal equivalent of 1/20 upto three significant figures is

(a) 0.0500 (b) 0.05000

(c) 0.0050 (d) 5.0×10^{-2}

11. Accuracy of measurement is determined by

(a) Absolute error (b) Percentage error

(c) Both (d) None of these

12. The radius of a sphere is $(5.3 \pm 0.1)\ cm$. The percentage error in its volume is

(a) $\frac{0.1}{5.3}\times100$ (b) $3\times\frac{0.1}{5.3}\times100$

(c) $\frac{0.1\times100}{3.53}$ (d) $3+\frac{0.1}{5.3}\times100$

13. A thin copper wire of length l *metre* increases in length by 2% when heated through 10ºC. What is the percentage increase in area when a square copper sheet of length l *metre* is heated through 10ºC

(a) 4% (b) 8%

(c) 16% (d) None of the above

14. 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 travelled is 478 *km*.

(a) Only (1) is correct (b) Only (2) is correct

(c) Both are correct (d) None of them is correct.

15. A physical parameter a can be determined by measuring the parameters b, c, d and e using the relation $a = b^{\alpha}c^{\beta}/d^{\gamma}e^{\delta}$. If the maximum errors in the measurement of b, c, d and e are $b_1\%$, $c_1\%$, $d_1\%$ and $e_1\%$, then the maximum error in the value of a determined by the experiment is

(a) $(b_1 + c_1 + d_1 + e_1)\%$

(b) $(b_1 + c_1 - d_1 - e_1)\%$

(c) $(\alpha b_1 + \beta c_1 - \gamma d_1 - \delta e_1)\%$

(d) $(\alpha b_1 + \beta c_1 + \gamma d_1 + \delta e_1)\%$

16. 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 error is

(a) $5.0 \pm 11\%$ (b) $5.0 \pm 1\%$

(c) $5.0 \pm 6\%$ (d) $1.25 \pm 5\%$

17. The resistance $R = \frac{V}{i}$ 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) 5.2% (d) $\frac{5}{2}\%$

18. 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

19. The length of a cylinder is measured with a meter rod having least count 0.1 *cm*. Its diameter is measured with vernier calipers 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%

20. 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/s^2 using the formula , $Y = \frac{4MgL}{\pi D^2 l}$, the maximum permissible error in Y is

(a) 7.96% (b) 4.56%

(c) 6.50% (d) 8.42%

21. According to *Joule*'s law of heating, heat produced $H = I^2Rt$, where I is current, R is resistance and t is time. If the errors in the measurement of I, R and t are 3%, 4% and 6% respectively then error in the measurement of H is

(a) $\pm 17\%$ (b) $\pm 16\%$

(c) $\pm 19\%$ (d) $\pm 25\%$

22. If there is a positive error of 50% in the measurement of velocity of a body, then the error in the measurement of kinetic energy is

(a) 25% (b) 50%

(c) 100% (d) 125%

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

(a) A (b) B

(c) C (d) D

24. If $L = 2.331\,cm$, $B = 2.1\,cm$, then $L + B =$ **[DCE 2003]**

(a) 4.431 *cm* (b) 4.43 *cm*

(c) 4.4 *cm* (d) 4 *cm*

25. The number of significant figures in all the given numbers 25.12, 2009, 4.156 and 1.217×10^{-4} is **[Pb. PET 2003]**

(a) 1 (b) 2

(c) 3 (d) 4

26. 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 **[J&K CET 2005]**

(a) 0.94 ± 0.00 *cm* (b) 0.94 ± 0.01 *cm*

(c) 0.94 ± 0.02 *cm* (d) 0.94 ± 0.005 *cm*

27. 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 maximum percentage error in the quantity X is **[Orissa JEE 2005]**

(a) $a\alpha + b\beta + c\gamma$ (b) $a\alpha + b\beta - c\gamma$

(c) $\frac{a}{\alpha} + \frac{b}{\beta} + \frac{c}{\gamma}$ (d) None of these

28. A physical quantity A is related to four observable a, b, c and d as follows, $A = \frac{a^2 b^3}{c\sqrt{d}}$, 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 **[Kerala PET 2005]**

(a) 12% (b) 7%

(c) 5% (d) 14%

1. If the acceleration due to gravity is $10\,ms^{-2}$ and the units of length and time are changed in kilometer and hour respectively, the numerical value of the acceleration is **[Kerala PET 2002]**

(a) 360000 (b) 72,000

(c) 36,000 (d) 129600

2. If L, C and R represent inductance, capacitance and resistance respectively, then which of the following does not represent dimensions of frequency **[IIT 1984]**

(a) $\frac{1}{RC}$ (b) $\frac{R}{L}$

(c) $\frac{1}{\sqrt{LC}}$ (d) $\frac{C}{L}$

3. Number of particles is given by $n = -D\frac{n_2 - n_1}{x_2 - x_1}$ crossing a unit area perpendicular to X-axis in unit time, where n_1 and n_2 are number of particles per unit volume for the value of x meant to x_2 and x_1. Find dimensions of D called as diffusion constant **[CPMT 1979]**

(a) M^0LT^2 (b) $M^0L^2T^{-4}$

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

4. 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

5. If the dimensions of length are expressed as $G^x c^y h^z$; where G, c and h are the universal gravitational constant, speed of light and Planck's constant respectively, then **[IIT 1992]**

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

(c) $y = \frac{1}{2}, z = \frac{3}{2}$ (d) $y = -\frac{3}{2}, z = \frac{1}{2}$

6. A highly rigid cubical block A of small mass M and side L is fixed rigidly onto another cubical block B of the same dimensions and of low modulus of rigidity η such that the lower face of A completely covers the upper face of B. The lower face of B is rigidly held on a horizontal surface. A small force F is applied perpendicular to one of the side faces of A. After the force is withdrawn block A executes small oscillations. The time period of which is given by **[IIT 1992]**

(a) $2\pi\sqrt{\frac{M\eta}{L}}$ (b) $2\pi\sqrt{\frac{L}{M\eta}}$

(c) $2\pi\sqrt{\frac{ML}{\eta}}$ (d) $2\pi\sqrt{\frac{M}{\eta L}}$

7. The pair(s) of physical quantities that have the same dimensions, is (are) **[IIT 1995]**

(a) Reynolds number and coefficient of friction

(b) Latent heat and gravitational potential

(c) Curie and frequency of a light wave

(d) Planck's constant and torque

8. The speed of light (c), gravitational constant (G) and Planck's constant (h) are taken as the fundamental units in a system. The dimension of time in this new system should be **[AMU 1995]**

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

9. 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 **[AMU (Eng.) 1999]**

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

10. $X = 3YZ^2$ find dimension of Y in (MKSA) system, if X and Z are the dimension of capacity and magnetic field respectively **[MP PMT 2003]**

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

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

11. In the relation $P = \frac{\alpha}{\beta}e^{-\frac{\alpha Z}{k\theta}}$ P is pressure, Z is the distance, k is Boltzmann constant and θ is the temperature. The dimensional formula of β will be **[IIT (Screening) 2004]**

(a) $[M^0L^2T^0]$ (b) $[M^1L^2T^1]$

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

12. The frequency of vibration of string is given by $\nu = \frac{p}{2l}\left[\frac{F}{m}\right]^{1/2}$. Here p is number of segments in the string and l is the length. The dimensional formula for m will be **[BHU 2004]**

(a) $[M^0LT^{-1}]$ (b) $[ML^0T^{-1}]$

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

13. **Column I** **Column II**

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

(ii) Light year (B) M

(iii) Dielectric strength (C) Dimensionless

(iv) Atomic weight (D) T

(v) Decibel (E) ML^2T^{-2}

(F) MT^{-3}

(G) T^{-1}

(H) L

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

(J) $L T^{-1}$

Choose the correct match

[IIT 1992]

(a) (i) G, (ii) H, (iii) C, (iv) B, (v) C

(b) (i) D, (ii) H, (iii) I, (iv) B, (v) G

(c) (i) G, (ii) H, (iii) I, (iv) B, (v) G

(d) None of the above

14. A wire has a mass $0.3 \pm 0.003\,g$, radius $0.5 \pm 0.005\,mm$ and length $6 \pm 0.06\,cm$. The maximum percentage error in the measurement of its density is **[IIT (Screening) 2004]**

(a) 1 (b) 2

(c) 3 (d) 4

15. If 97.52 is divided by 2.54, the correct result in terms of significant figures is

(a) 38.4 (b) 38.3937

(c) 38.394 (d) 38.39

AR Assertion & Reason

For AIIMS Aspirants

Choose any one of the following four responses :

(a) If both assertion and reason are true and the reason is the correct explanation of the assertion.

(b) If both assertion and reason are true but reason is not the correct explanation of the assertion.

(c) If assertion is true but reason is false.

(d) If the assertion and reason both are false.

(e) If assertion is false but reason is true.

1. Assertion : '*Light year*' and 'Wavelength' both measure distance.

Reason : Both have dimensions of time.

2. Assertion : Light year and year, both measure time.

Reason : Because light year is the time that light takes to reach the earth from the sun.

3. Assertion : Force cannot be added to pressure.

Reason : Because their dimensions are different.

4. Assertion : Linear mass density has the dimensions of $[M^1L^{-1}T^0]$.

Reason : Because density is always mass per unit volume.

5. Assertion : Rate of flow of a liquid represents velocity of flow.

Reason : The dimensions of rate of flow are $[M^0L^1T^{-1}]$.

6. Assertion : Units of Rydberg constant R are m^{-1}

Reason : It follows from Bohr's formula $\bar{v} = R\left(\frac{1}{n_1^2} - \frac{1}{n_2^2}\right)$, where the symbols have their usual meaning.

7. Assertion : Parallex method cannot be used for measuring distances of stars more than 100 light years away.

Reason : Because parallex angle reduces so much that it cannot be measured accurately.

8. Assertion : Number of significant figures in 0.005 is one and that in 0.500 is three.

Reason : This is because zeros are not significant.

9. Assertion : Out of three measurements $l = 0.7\ m$; $l = 0.70\ m$ and $l = 0.700\ m$, the last one is most accurate.

Reason : In every measurement, only the last significant digit is not accurately known.

10. Assertion : Mass, length and time are fundamental physical quantities.
Reason : They are independent of each other.

11. Assertion : Density is a derived physical quantity.
Reason : Density cannot be derived from the fundamental physical quantities.

12. Assertion : Now a days a standard *metre* is defined as in terms of the wavelength of light.
Reason : Light has no relation with length.

13. Assertion : Radar is used to detect an aeroplane in the sky
Reason : Radar works on the principle of reflection of waves.

14. Assertion : Surface tension and surface energy have the same dimensions.
Reason : Because both have the same S.I. unit

15. Assertion : In $y = A\sin(\omega t - kx)$, $(\omega t - kx)$ is dimensionless.
Reason : Because dimension of $\omega = [M^0 L^0 T]$.

16. Assertion : Radian is the unit of distance.
Reason : One radian is the angle subtended at the centre of a circle by an arc equal in length to the radius of the circle.

17. Assertion : A.U. is much bigger than Å.
Reason : A.U. stands for astronomical unit and Å stands from *Angstrom*.

18. Assertion : When we change the unit of measurement of a quantity, its numerical value changes.
Reason : Smaller the unit of measurement smaller is its numerical value.

19. Assertion : Dimensional constants are the quantities whose value are constant.
Reason : Dimensional constants are dimensionless.

20. Assertion : The time period of a pendulum is given by the formula, $T = 2\pi\sqrt{g/l}$.
Reason : According to the principle of homogeneity of dimensions, only that formula is correct in which the dimensions of L.H.S. is equal to dimensions of R.H.S.

21. Assertion : In the relation $f = \frac{1}{2l}\sqrt{\frac{T}{m}}$, where symbols have standard meaning, m represent linear mass density.
Reason : The frequency has the dimensions of inverse of time.

22. Assertion : The graph between P and Q is straight line, when P/Q is constant.
Reason : The straight line graph means that P proportional to Q or P is equal to constant multiplied by Q.

23. Assertion : Avogadro number is the number of atoms in one gram mole.
Reason : Avogadro number is a dimensionless constant.

24. Assertion : L/R and CR both have same dimensions.
Reason : L/R and CR both have dimension of time.

25. Assertion : The quantity $(1/\sqrt{\mu_0\varepsilon_0})$ is dimensionally equal to velocity and numerically equal to velocity of light.
Reason : μ_0 is permeability of free space and ε_0 is the permittivity of free space.

Answers

Units

1	c	2	b	3	d	4	c	5	c
6	d	7	c	8	d	9	c	10	c
11	a	12	c	13	c	14	b	15	d
16	d	17	c	18	a	19	b	20	d
21	d	22	a	23	a	24	b	25	d
26	b	27	d	28	d	29	d	30	b
31	a	32	b	33	a	34	b	35	a
36	b	37	a	38	b	39	b	40	b
41	d	42	c	43	c, b	44	c	45	b
46	a	47	c	48	c	49	a	50	a
51	b	52	b	53	c	54	c	55	c
56	c	57	b	58	a	59	c	60	a
61	c	62	c	63	d	64	d	65	b

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66	c	67	a	68	b	69	c	70	b
71	d	72	b	73	b	74	d	75	c
76	b	77	b	78	b	79	c	80	c
81	a	82	a	83	d	84	c	85	b
86	d	87	d	88	b	89	a	90	c
91	a	92	d	93	b	94	a	95	d
96	a	97	b	98	a	99	d	100	b
101	d	102	d	103	a	104	a	105	d
106	b	107	b	108	b	109	b		

Dimensions

1	a	2	c	3	b	4	a	5	b
6	c	7	c	8	b	9	ad	10	a
11	d	12	b	13	a	14	a	15	a
16	b	17	b	18	d	19	a	20	c
21	b	22	a	23	b	24	d	25	a
26	d	27	a	28	d	29	d	30	d
31	c	32	c	33	a	34	a	35	b
36	b	37	c	38	c	39	a	40	b
41	a	42	b	43	d	44	d	45	a
46	d	47	b	48	d	49	b	50	a
51	a	52	d	53	b	54	b	55	c
56	c	57	d	58	a	59	a	60	c
61	b	62	b	63	c	64	a	65	a
66	b	67	a	68	d	69	c	70	a
71	a	72	c	73	c	74	a	75	b
76	d	77	a	78	a	79	b	80	b
81	d	82	b	83	bc	84	c	85	d
86	d	87	c	88	a	89	a	90	a
91	a	92	b	93	b	94	a	95	b
96	a	97	a	98	a	99	c	100	a
101	d	102	b	103	b	104	d	105	c
106	d	107	c	108	c	109	a	110	b
111	c	112	d	113	b	114	a	115	b
116	c	117	d	118	d	119	d	120	a
121	a	122	c	123	b	124	d	125	a
126	a	127	a	128	b	129	c	130	c
131	d	132	a	133	a	134	c	135	b
136	d	137	b	138	a	139	a	140	d
141	d	142	d						

Errors of Measurement

1	c	2	b	3	b	4	b	5	b
6	c	7	b	8	c	9	c	10	a
11	b	12	b	13	a	14	c	15	d
16	a	17	b	18	b	19	c	20	c
21	b	22	d	23	c	24	c	25	d
26	c	27	a	28	d				

Critical Thinking Questions

1	d	2	d	3	d	4	c	5	bd
6	d	7	abc	8	a	9	a	10	d
11	a	12	c	13	a	14	d	15	a

Assertion and Reason

1	c	2	d	3	a	4	c	5	d
6	a	7	a	8	c	9	b	10	a
11	c	12	c	13	a	14	c	15	c
16	e	17	b	18	c	19	c	20	e
21	b	22	a	23	c	24	a	25	b