PHYSICS

BOOKS - UNIVERSAL BOOK DEPOT 1960 PHYSICS (HINGLISH)

UNITS, DIMENSION & MEASUREMENTS

Others

1. Light year is a unit of

A. Time

B. Mass

C. Distance

D. Energy

Answer: C

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2. The magnitude of any physical quantity

A. Depends on the method of measurement

B. Does not depend on the method of measurement

C. Is more in SI system than in CGS system

D. Directly proportional to the fundamental units of mass, length and time

Answer: B

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3. Which of the following is not equal to watt?

A. Joule/second

B. Ampere $\times$ volt

C. (Ampere) $\times$ ohm

D. Ampere/volt

Answer: D

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4. Newton - second is the unit of

A. Velocity

B. Angular momentum

C. Momentum

D. Energy

Answer: C

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5. Which of the following is not represented in correct unit

A. $\frac{\text{Stress}}{\text{Strain}} = N/m^2$

B. Surface tension $= N/m$

C. Energy $=$ kg-m/sec

D. Pressure $= N/m^2$

Answer: C

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6. One second is equal to

A. 1650763-73 time periods of Kr clock

B. 652189.63 time periods of Kr clock

C. 1650763.73 time periods of Cs clock

D. 9192631770 time periods of Cs block

Answer: D

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7. One nanometre is equal to

A. 10^9 mm

B. 10^{-6} cm

C. 10^{-7} cm

D. 10^{-9} cm

Answer: C

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8. A micron is related to centimetre as

A. 1 micron $= 10^{-8}$ cm

B. 1 micron $= 10^{-6}$cm

C. 1 micron $= 10^{-5}$cm

D. 1 micron $= 10^{-4}$CM

Answer: D

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9. The unit of power is

A. Joule

B. Joule per second only

C. Joule per secoind and watt both

D. Only watt

Answer: C

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10. A suitable unit for gravitational constant is

A. $kg - m\sec^{-1}$

B. $Nm^{-1}\sec$

C. Nm^2kg^{-2}

D. $kgm\sec^{-1}$

Answer: C

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11. SI unit of pressure is

A. Pascal

B. Dynes $/cm^2$

C. cm of Hg

D. Atmosphere

Answer: A

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12. The unit of angular acceleration in the SI system is

A. Nkg^{-1}

B. ms^{-2}

C. $rads^{-2}$

D. $mkg^{-1}K$

Answer: C

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13. The unit of Stefan's constant σ is

A. $Wm^{-2}K^{-1}$

B. $Wm^{2}K^{-4}$

C. $Wm^{-2}K^{-4}$

D. $Wm^{-2}K^{4}$

Answer: C

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

A. $W - s$

B. $kg - m/\sec$

C. $N - m$

D. Joule

Answer: B

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15. In $S = a + bt + ct^2$. S is measured in metres and t in seconds.

The unit of c is

A. None

B. m

C. ms^{-1}

D. ms^{-2}

Answer: D

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16. Joule-second is the unit of

A. Work

B. Momentum

C. Pressure

D. Angular momentum

Answer: D

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17. Unit of energy is SI system is

A. Erg

B. Calorie

C. Joule

D. Electron volt

Answer: C

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18. A cube has numerically equal volume and surface area. The volume of such a cube is

A. 216 units

B. 1000 units

C. 2000 units

D. 3000 units

Answer: A

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

A. 6 microns

B. 60 microns

C. 600 microns

D. 0.6 microns

Answer: B

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20. Elector volt is a unit of

A. Charge

B. Potential difference

C. Momentum

D. Energy

Answer: D

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21. 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

Answer: D

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22. Unit of power is

A. Kilowatt

B. Kilowatt-hour

C. Dyne

D. Joule

Answer: A

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23. Density of wood is $0.5g/cc$ in the CGS system of units. The corresponding value in MKS units is

A. 500

B. 5

C. 0.5

D. 5000

Answer: A

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24. Unit of energy is SI system is

A. J/sec

B. Watt-day

C. Kilowatt

D. gm-cm $/ \sec^2$

Answer: B

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25. Which is the correct unit for measuring nuclear radii

A. Micron

B. Millimetre

C. Angstrom

D. Fermi

Answer: D

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26. One Mach number of equal to

A. Velocity of light

B. Velocity of sound $(332m/\sec)$

C. 1km/sec

D. 1m/sec

Answer: B

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27. The unit for nuclear dose given to a patient is

A. Fermi

B. Rutherford

C. Curie

D. Roentgen

Answer: D

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28. Volt/metre is the unit of

A. Potential

B. Work

C. Force

D. Electric intensity

Answer: D

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29. Newton $/\,\mathrm{metre}^2$ is the unit of

A. Energy

B. Momentum

C. Force

D. Pressure

Answer: D

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30. The unit of surface tension in SI system is

A. Dyne $/cm^2$

B. Newton $/m$

C. Dyne /cm

D. Newton $/m^2$

Answer: B

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31. The unit of reduction factor of tangent galvanometer is

A. Ampere

B. Gauss

C. Radian

D. None of these

Answer: A

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32. The unit of self inductance of a coil is

A. Farad

B. Henry

C. Weber

D. Tesla

Answer: B

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33. Henry ohm canbe expressed in

A. Second

B. Coulomb

C. Mho

D. Metre

Answer: A

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34. The SI unit of momentum is

A. $\frac{kg}{m}$

B. $\frac{kg.\ m}{\sec}$

C. $\frac{kg.\ m^2}{\sec}$

D. $kg \times \text{Newton}$

Answer: B

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35. The velocity of a particle depends upon as $v = a + bt + ct^2$, if the velocity is in $m/\sec$, the unit of a will be

A. m/sec

B. $m/\sec^2$

C. $m^2/\sec$

D. $m/\sec^2$

Answer: A

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

A. $10^5 eV$

B. $10^6 V$

C. $10^4 eV$

D. $10^7 eV$

Answer: B

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37. $Erg = m^{-1}$ can be the unit of measure for

A. Force

B. Momentum

C. Power

D. Acceleration

Answer: A

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38. The unit of potential energy is

A. $g\left(cm/\sec^2\right)$

B. $g(cm/\sec)^2$

C. $g\left(cm^2/\sec\right)$

D. $g(cm/\sec)$

Answer: B

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39. Which of the following represents a volt?

A. Joule/second

B. Watt/Ampere

C. Watt/Coulomb

D. Coulomb/Joule

Answer: B

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40. Kilowatt-hour is a unit of

A. Electrical charge

B. Energy

C. Power

D. Force

Answer: B

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41. What is the SI unit of permeability

A. Henry per metre

B. Tesla metre per ampere

C. Weber per ampere metre

D. All the above units are correct

Answer: D

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42. In which of the following systems of unit, Weber is the unit of magnetic flux

A. CGS

B. MKS

C. SI

D. None of these

Answer: C

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43. Tesla is a unit for measuring

A. Magnetic moment

B. Magnetic induction

C. Magnetic intensity

D. Magnetic pole strength

Answer: B::C

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44. 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

Answer: C

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45. Oersted is a unit of

A. Dip

B. Magnetic intensity

C. Magnetic moment

D. Pole strength

Answer: B

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46. Ampere - hour is a unit of

A. Quantity of electricity

B. Strength of electric current

C. Power

D. Energy

Answer: A

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47. The unit of specific resistance is

A. Ohm/cm^2

B. Ohm/cm

C. $Ohm - cm$

D. $(Ohm - cm)^{-1}$

Answer: C

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48. The binding energy of a nucleon in a nucleus is of the order of a few

A. eV

B. Ergs

C. MeV

D. Volts

Answer: C

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49. Parsec is a unit of

A. Distance

B. Velocity

C. Time

D. Angle

Answer: A

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50. 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. $n_1u_1 = n_2u_2$

B. $n_1u_1 + n_2u_2 = 0$

C. $n_1n_2 = u_1u_2$

D. $(n_1 + u_1) = (n_2 + u_2)$

Answer: A

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51. $1eV$ is

A. Same as joule

B. $1.6 \times 10^{-19} J$

C. $1V$

D. $1.6 \times 10^{-19} C$

Answer: B

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52. $1kWh =$

A. $1000W$

B. $36 \times 10^5 J$

C. $1000J$

D. $3600J$

Answer: B

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53. Universal time is based on

A. Rotation of the earth on its axis

B. Earth's orbital motion around the earth

C. Vibrations of cesium atom

D. Oscillations of quartz crystal

Answer: C

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54. The nuclear cross-section is measured in barn, it is equal to

A. $10^{-20}m^2$

B. $10^{-30}m^2$

C. $10^{-28}m^2$

D. $10^{-14}m^2$

Answer: C

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55. Unit of moment of inertia in MKS system

A. $kg \times cm^2$

B. kg/cm^2

C. $kg \times m^2$

D. $\text{Joule} \times m$

Answer: C

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56. Unit of stress is

A. N/m

B. $N - m$

C. N/m^2

D. $N - m^2$

Answer: C

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57. Unit of Stefan's constant is

A. Js^{-1}

B. $Jm^{-2}s^{-1}K^{-4}$

C. Jm^{-2}

D. Js

Answer: B

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58. Unit of magnetic moment is

A. Ampere-metre^2

B. Ampere-metre

C. Weber-metre^2

D. Weber/metre

Answer: A

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59. Curie is a unit of

A. Enertgy of γ- rays

B. Half life

C. Radioactivity

D. Intensity of γ-rays

Answer: C

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60. Hertz is the unit for

A. Frequency

B. Force

C. Electric charge

D. Magnetic flux

Answer: A

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61. One pico Farad is equal to

A. $10^{-24}F$

B. $10^{-18}F$

C. $10^{-12}F$

D. $10^{-6}F$

Answer: C

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62. In SI, Henry is the unit of

A. Self inductance

B. Mutual inductance

C. (a) and (b) both

D. None of the above

Answer: C

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63. The unit of e.m.f is

A. Joule

B. Joule-Coulomb

C. Volt-Coulomb

D. Joule/Coulomb

Answer: D

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64. Which of the following is not the unit of time

A. Micro second

B. Leap year

C. Solar day

D. Parallactic second

Answer: D

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65. Unit of self inductance is

A. $\frac{\text{Newton-second}}{\text{Coulomb} \times \text{Ampere}}$

B. $\frac{\text{Joule}/\text{Coulomb} \times \text{second}}{\text{Ampere}}$

C. $\frac{\text{Volt} \times \text{metre}}{\text{Coulomb}}$

D. $\frac{\text{Newton} \times \text{metre}}{\text{Ampere}}$

Answer: B

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66. To determine the young's modulus of a wire , the formula is $Y = \frac{F}{A} \cdot \frac{L}{\Delta l}$, where L = l ength ,A = area of cross - section of the wire , ΔL = change in the length of the wire when streched with a force F. Find the conversion factor to change it from CGS t o MKS system.

A. 1

B. 10

C. 0.1

D. 0.01

Answer: C

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67. Young's modules of a material has the same unit as

A. Pressure

B. Strain

C. Compressibility

D. Force

Answer: A

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68. One yard in SI units is equal

A. 1.9144 metre

B. 0.9144 metre

C. 0.09144 kilometre

D. 1.0936 kilometre

Answer: B

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69. Which of the following is smallest unit?

A. Millimetre

B. Angstrom

C. Fermi

D. Metre

Answer: C

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70. Which one of the following pairs of quantities and their units is a proper match

A. Electric field -Coulomb/m

B. Magnetic flux-Weber

C. Power-Farad

D. Capacitance -Henry

Answer: B

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71. The units of modulus of rigidity are

A. $N - m$

B. N / m

C. $N - m^2$

D. N / m^2

Answer: D

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72. The unit of absolute permittivity is

A. Fm (Farad -meter)

B. Fm^{-1} (Farad/meter)

C. $Fm^{-2}\left(\text{Farad} / \text{metre}^2\right)$

D. F (Farad)

Answer: B

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73. Match List-I with List-II and select the correct answer using the codes given below the lists

List-I	List-II
I. *Joule*	A. *Henry* × *Amp/sec*
II. *Watt*	B. *Farad* × *Volt*
III. *Volt*	C. *Coulomb* × *Volt*
IV. *Coulomb*	D. *Oersted* × *cm*
	E. *Amp* × *Gauss*
	F. Amp^2 × *Ohm*

A. $I - A, II - F, III - E, IV - D$

B. $I - C, II - F, III - A, IV - B$

C. $I - C, II - F, III - A, IV - E$

D. $I - B, II - F, III - A, IV - C$

Answer: B

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74. Which relation is wrong

A. $1\text{Calorie} = 4.18\text{Joules}$

B. $1\text{Å} = 10^{-10}m$

C. $1MeV = 1.6 \times 10^{-13}$Joules

D. $1\text{Newton} = 10^{-5}$ Dynes

Answer: D

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

A. km/s

B. $km - s$

C. km/s^2

D. $km - s^2$

Answer: C

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76. The equation $\left(P + \frac{a}{V^2}\right)(V - b)$ constant. The units of a are

A. $\text{Dyne} \times cm^5$

B. $\text{Dyne} \times cm^4$

C. Dyne/cm^3

D. Dyne/cm^2

Answer: B

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

A. Work

B. Pressure

C. Volume

D. Area

Answer: B

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78. Match List-I with List-II and select the correct answer by using the codes given below the lists

List-I	List-II
(a) Distance between earth and stars	1. Microns
(b) Inter-atomic distance in a solid	2. Angstroms
(c) Size of the nucleus	3. Light years
(d) Wavelength of infrared laser	4. *Fermi*
	5. Kilometres

A. 5, 4, 2, 1

B. 3, 2, 4, 1

C. 5, 2, 4, 3

D. 3, 4, 1, 2

Answer: B

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79. Unit of impulse is

A. Newton

B. kg-m

C. $kg - m/s$

D. Joule

Answer: C

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80. Which is not a unit of electric field

A. NC^{-1}

B. Vm^{-1}

C. JC^{-1}

D. $JC^{-1}m^{-1}$

Answer: C

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

A. $273.15K$

B. $272.85K$

C. $273K$

D. $273.2K$

Answer: A

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82. Torr is the unit of physical quantity

A. Pressure

B. Volume

C. Density

D. Flux

Answer: A

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83. Which of the following is a derived unit

A. Unit of mass

B. Unit of length

C. Unit of time

D. Unit of volume

Answer: D

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84. Dyne/cm is not a time of

A. Pressure

B. Stress

C. Strain

D. Young's modulus

Answer: C

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85. The units of angular momentum are

A. $kg - m^2 / s^2$

B. Joule-s

C. Joule/s

D. $kg - m - s^2$

Answer: B

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86. Which of the following is not the unit of energy ?

A. Calorie

B. Joule

C. Electro volt

D. Watt

Answer: D

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87. Which of the following is not a unit of time

A. Leap year

B. Microsecond

C. Lunar month

D. Light year

Answer: D

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

A. J

B. $J - kg^{-1}$

C. $J - kg$

D. $J - kg^2$

Answer: B

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

A. Nm

B. Nm^{-2}

C. $\text{Dyne}cm^{-2}$

D. Mega Pascal

Answer: A

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90. In CGS system the magnitude of the force is 100 dynes. In another system where the fundamental phyical quamtities are kilogram , meter , and minute, find the magnitude of the force.

A. 0.036

B. 0.36

C. 3.6

D. 36

Answer: C

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91. The unit of L/R is (where $L=$ inductance and $R=$ resistance)

A. Second

B. $\sec^{-1}$

C. Volt-Coulomb

D. Ampere

Answer: A

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92. Which is different from others by units ?

A. Phase difference

B. Mechanical equivalent

C. Loudness of sound

D. Poisson's ratio

Answer: D

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93. Length cannot be measured by

A. Fermi

B. Debye

C. Micron

D. Light year

Answer: B

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94. The value of Planck's constant in SI unit is

A. $6.63 \times 10^{-34} J - \sec$

B. $6.63 \times 10^{34} J / \sec$

C. $6.63 \times 10^{-34} kg - m^2$

D. $6.63 \times 10^{34} kg / \sec$

Answer: A

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95. A physical quantity is measured and the result is expressed as nu where u is the unit used and n is the numberical value. If the result is expressed in various units then

A. $n \propto u^2$

B. $n \propto u$

C. $n \propto \sqrt{u}$

D. $n \propto \frac{1}{u}$

Answer: D

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96. Faraday is the unit of

A. Charge

B. emf

C. Mass

D. Energy

Answer: A

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97. Candela is the unit of

A. Electric intensity

B. Luminous intensity

C. Sound intensity

D. None of these

Answer: B

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98. The unit of reactance is

A. Ohm

B. Volt

C. Mho

D. Newton

Answer: A

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99. The unit of Planck's constant is

A. Joule

B. Joule/s

C. Joule/m

D. Joule-s

Answer: D

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100. Number of base SI units is

A. 4

B. 7

C. 3

D. 5

Answer: B

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101. SI unit of permittivity is

A. $C^2m^2N^{-1}$

B. $C^{-1}m^2N^{-2}$

C. $C^2m^2N^2$

D. $C^2m^{-2}N^{-1}$

Answer: D

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102. Which does not has the same unit as others

A. Watt-sec

B. Kilowatt-hour

C. eV

D. J-sec

Answer: D

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103. S.I. Unit of surface tension is:

A. Nm^{-1}

B. Nm^{-2}

C. N^2m^{-1}

D. Nm^{-3}

Answer: A

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104. Which of the following system of units is not based on units of mass, length and time alone

A. SI

B. MKS

C. FPS

D. CGS

Answer: A

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

A. $m/kg-s$

B. $m-s/kg^2$

C. $kg/m-s^2$

D. $kg/m-s$

Answer: D

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106. The unit of Young's modulus is

A. Nm^2

B. Nm^{-2}

C. Nm

D. Nm^{-1}

Answer: B

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107. One femtometer is equivalent to

A. $10^{15}m$

B. $10^{-15}m$

C. $10^{-12}m$

D. $10^{12}m$

Answer: B

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108. Light emitted by Krypton 86 is 6057.8021 Å. Calculate number of wavelengths of Krypton 86 in one metre. What is the order of magnitude ?

A. 155316.13

B. 1650763.73

C. 652189.63

D. 2348123.73

Answer: B

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109. Which of the following pairs is wrong

A. Pressure-Baromter

B. Relative density-Pyrometer

C. Temperature-Thermometer

D. Earthquake-Seismograph

Answer: B

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110. Select the pair whose dimensions are same

A. Pressure and stress

B. Stress and strain

C. Pressure and force

D. Power and force

Answer: A

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111. Dimensional formula $ML^{-1}T^2$ does not represent the physical quantity

A. Young's modulus of elasticity

B. Stress

C. Strain

D. Pressure

Answer: C

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112. Dimensionasl formula ML^2T^{-3} represents

A. Force

B. Power

C. Energy

D. Work

Answer: B

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113. The dimensions of calorie are

A. ML^2T^{-2}

B. MLT^{-2}

C. ML^2T^{-1}

D. ML^2T^{-3}

Answer: A

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114. Whose dimensions is ML^2T^{-1}

A. Torque

B. Angular momentum

C. Power

D. Work

Answer: B

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115. If L and R denote inductance and resistance , respectively , then the dimensions of L/R are

A. $M^0L^0T^{-1}$

B. M^0LT^0

C. M^0L^0T

D. Cannot be represented in terms of M, L and T

Answer: C

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116. Which pair has the same dimensions

A. Work and power

B. Density and relative density

C. Momentum and impulse

D. Stress and strain

Answer: C

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117. If C and R denote capacitance and resistance respectively, then the dimensional formula of CR is

A. $M^0L^0T^2$

B. M^0L^0T

C. ML^{-1}

D. None of the above

Answer: B

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118. The dimensions of the quantities in one (or more) of the following pairs are the same . Identify the pair(s)

A. Torque and work

B. Angular momentum and work

C. Energy and Young's modulus

D. Light year and wavelength

Answer: A::D

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119. Dimensional formula for latent heat is_____

A. $M^0L^2T^{-2}$

B. MLT^{-2}

C. ML^2T^{-2}

D. ML^2T^{-1}

Answer: A

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120. Dimensional formula for volume elasticity is

A. $M^1L^{-2}T^{-2}$

B. $M^1L^{-3}T^{-2}$

C. $M^1L^2T^{-2}$

D. $M^1L^{-1}T^{-2}$

Answer: D

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121. The dimensionas of universal gravitational constant are ____

A. $M^{-2}L^2T^{-2}$

B. $M^{-1}L^3T^{-2}$

C. $ML^{-1}T^{-2}$

D. ML^2T^{-2}

Answer: B

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122. The dimensional formula of angular velocity is

A. $M^0L^0T^{-1}$

B. MLT^{-1}

C. $M^0L^0T^1$

D. ML^0T^{-2}

Answer: A

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123. The dimensions of power are _____

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

B. $M^2L^1T^{-2}$

C. $M^1L^2T^{-1}$

D. $M^1L^1T^{-2}$

Answer: A

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124. The dimensions of couple are _____

A. ML^2T^{-2}

B. MLT^{-2}

C. $ML^{-1}T^{-3}$

D. $ML^{-2}T^{-2}$

Answer: A

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125. The dimensional formula for angular momentum is

A. ML^2T^{-2}

B. ML^2T^{-1}

C. MLT^{-1}

D. $M^0L^2T^{-2}$

Answer: B

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126. The dimensional formula of impulse is

A. MLT^{-2}

B. MLT^{-1}

C. ML^2T^{-1}

D. M^2LT^{-1}

Answer: B

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127. The dimensional formula for the modulus of rigidity is

A. ML^2T^{-2}

B. $ML^{-1}T^{-3}$

C. $ML^{-2}T^{-2}$

D. $ML^{-1}T^{-2}$

Answer: D

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

A. M^0LT^{-1}

B. $M^0L^0T^{-2}$

C. $M^0L^0T^{-1}$

D. MLT^{-3}

Answer: A

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

A. $ML^{-2}T^{-3}$

B. ML^2T^{-2}

C. ML^2T^{-1}

D. $ML^{-2}T^{-2}$

Answer: C

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130. Out of the following pair, which one NOT have identical dimensions is

A. Angular momentum and Planck's constant

B. Moment of inertia and moment of a force

C. Work and torque

D. Impulse and momentum

Answer: B

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131. The dimensional formul for impulse is same as the dimensional formula for

A. Momentum

B. Force

C. Rate of change of momentum

D. Torque

Answer: A

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132. 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

Answer: B

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133. Planck's constant has the dimension (unit) of

A. Energy

B. Linear momentum

C. Work

D. Angular momentum

Answer: D

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134. The van der Waal's equation of state for some gases can be expressed as :

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

Where P is the pressure , V is the molar volume , and T is the absolute temperature of the given sample of gas and $a, b,$ and R are constants.

The dimensions of a are

A. ML^5T^{-2}

B. $ML^{-1}T^{-2}$

C. $M^0L^3T^0$

D. $M^0L^6T^0$

Answer: A

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135. If V denotes te potential difference across the plate of a capacitor of capacitance C, the dimensions of CV^2 are

A. Not expressible in MLT

B. MLT^{-2}

C. M^2LT^{-1}

D. ML^2T^{-2}

Answer: D

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136. If L denotes the inductance of an inductor through which a current i is flowing, the dimensions of Li^2 are

A. ML^2T^{-2}

B. Not expressible in MLT

C. MLT^{-2}

D. $M^2L^2T^{-2}$

Answer: A

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137. Of the following quantities , which one has the 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 per unit mass

Answer: D

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138. A sperical body of mass m and radius r is allowed to fall in a medium of viscosity η. The time in which the velocity of the body increases from zero to 0.63 times the terminal velocity (v) is called constant (τ). Dimensionally , τ can be represented by

A. $\frac{mr^2}{6\pi\eta}$

B. $\sqrt{\left(\frac{6\pi mr\eta}{g^2}\right)}$

C. $\frac{m}{6\pi\eta rv}$

D. None of the above

Answer: D

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139. The frequency f of vibrations of a mass m suspended from a spring of spring constant k is given by $f = Cm^x k^y$, where C is a dimensionnless constant. The values of x and y are, respectively,

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. $x = -\frac{1}{2}, y = \frac{1}{2}$

Answer: D

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140. The quantities A and B are related by the relation $A/B = m$, where m is the linear mass density and A is the force , the dimensions of B will be

A. Pressure

B. Work

C. Latent heat

D. None of the above

Answer: C

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141. The velocity of water wave v 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. $v^2 \propto \lambda g^- \rho^{-1}$

B. $v^2 \propto g\lambda\rho$

C. $v^2 \propto g\lambda$

D. $v^2 \propto g^{-1}\lambda^{-3}$

Answer: C

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142. The dimensions of Farad are

A. $M^{-1}L^{-2}T^2Q^2$

B. $M^{-1}L^{-2}TQ$

C. $M^{-1}L^{-2}T^{-2}Q$

D. $M^{-1}L^{-2}TQ^2$

Answer: A

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143. The dimensional formula fo resistivity in terms of M, L, T and Q where Q stands for the dimensions of charge is

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

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

C. $ML^2T^{-1}Q^{-1}$

D. $MLT^{-1}Q^{-1}$

Answer: A

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144. The equation of a wave is given by $Y = A\sin\omega\left(\frac{x}{v} - k\right)$, where ω is the angular velocity and v is the linear velocity. Find the dimension of k.

A. LT

B. T

C. T^{-1}

D. T^2

Answer: B

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145. The dimensions of coefficient of thermal conductivity is

A. $ML^2T^{-2}K^{-1}$

B. $MLT^{-3}K^{-1}$

C. $MLT^{-2}K^{-1}$

D. $MLT^{-3}K$

Answer: B

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146. Dimensional formula of velocity of sound is

A. M^0LT^{-2}

B. LT^0

C. M^0LT^{-1}

D. $M^0L^{-1}T^{-1}$

Answer: C

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147. Dimensional formula of capacitance is

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

B. $ML^2T^4A^{-2}$

C. $MLT(-4)A^2$

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

Answer: A

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148. MLT^{-1} represents the dimensional formula of

A. Power

B. Momentum

C. Force

D. Couple

Answer: B

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149. Dimensional formula of heat energy is

A. ML^2T^{-2}

B. MLT^{-1}

C. $M^0L^0T^{-2}$

D. None of these

Answer: A

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

A. $M^0L^0T^0$

B. $M^0L^0T^2$

C. $M^2L^0T^2$

D. MLT^2

Answer: B

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151. Which of the following quantities has the same dimensions as that of energy

A. power

B. force

C. momentum

D. work

Answer: D

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152. The dimensionsof "time constant" $\frac{L}{R}$ during growth and decay of current in all inductive circuit is same as that of

A. Constant

B. Resistance

C. Current

D. Time

Answer: D

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153. The period T of a soap bubble under SHM is given by $T = P^a D^b S^c$, where P is pressure, D, is density and S is surface tension. Then the values of a, b and c are

A. $-\frac{3}{2}, \frac{1}{2}, 1$

B. $-1, \ -2, 3$

C. $\frac{1}{2}, \ -\frac{3}{2}, \ -\frac{1}{2}$

D. $1, 2, \frac{1}{3}$

Answer: A

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154. Which of the following pairs of physical quantities has the same dimensions

A. Work and power

B. Momentum and energy

C. Force and power

D. Work and energy

Answer: D

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155. 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. $1, \frac{1}{2}$

B. $\frac{1}{2}, \frac{1}{2}$

C. $\frac{1}{2}, 1$

D. $1, 1$

Answer: B

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156. Which one of the following does not have tha same dimensions?

A. Work and energy

B. Angle and strain

C. Relative density and refractive index

D. Planck constant and energy

Answer: D

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157. Dimensions of frequency are

A. $M^0L^{-1}T^0$

B. $M^0L^0T^{-1}$

C. M^0L^0T

D. MT^{-2}

Answer: B

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

A. power

B. work

C. torque

D. energy

Answer: A

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159. A small steel ball of radius r is allowed to fall under gravity through a column of a viscous liquid of coefficient of viscosity η. After some time the velocity of the ball attains a constant value known as terminal velocity v_T. The terminal velocity depends on (i) the mass of the ball m (ii) η, (iii) r and (iv) acceleration due to gravity g . Which of the following relations is dimensionally correct?

A. $v_T \propto \frac{mg}{\eta r}$

B. $v_T \propto \frac{\eta r}{mg}$

C. $v_T \propto \eta r mg$

D. $v_T \propto \frac{mgr}{\eta}$

Answer: A

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160. a quantity X is given by $\varepsilon_0 L \frac{\Delta V}{\Delta t}$ where $\in_0$ is the permittivity of the free space, L is a length, ΔV is a potential difference and Δt is a time interval. The dimensinal formula for X is the same as that of

A. Resistance

B. Charge

C. Voltage

D. Current

Answer: D

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161. The dimensions of $\varepsilon_0 \mu_0$ are

A. LT^{-1}

B. $L^{-2}T^{2}$

C. $M^{-1}L^{-3}Q^{2}T^{2}$

D. $M^{-1}L^{-3}I^{2}T^{2}$

Answer: B

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162. The expression $\left[ML^{2}T^{-2}\right]$ represents

A. Pressure

B. Kinetic energy

C. Momentum

D. Power

Answer: B

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163. Find the dimensions of physical quantity X in the equation $\text{Force} = \frac{X}{\text{Density}}$.

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

B. $M^2L^{-2}T^{-1}$

C. $M^2L^{-2}T^{-2}$

D. $M^1L^{-2}T^{-1}$

Answer: C

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

A. L^2I

B. L^2I^2

C. LI^2

D. $\frac{1}{LI}$

Answer: C

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165. The Martians force (F), acceleration (A) and time (T) as their fundamental physical quantities. The dimensions of length on Martians system are

A. FT^2

B. $F^{-1}T^2$

C. $F^{-1}A^2T^{-1}$

D. AT^2

Answer: D

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166. The dimension of $\frac{1}{\sqrt{\varepsilon_0\mu_0}}$ is that of

A. Velocity

B. Time

C. Capacity

D. Distance

Answer: A

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167. An athlletic coach told his team that muscle times speed equals power. What dimesions does he view for muscle?

A. MLT^{-2}

B. ML^2T^{-2}

C. MLT^2

D. L

Answer: A

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168. The foundations of dimensional analysis were laid down by

A. Gallileo

B. Newton

C. Fourier

D. Joule

Answer: C

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169. The dimensional formula of wave number is

A. $M^0L^0T^{-1}$

B. $M^0L^{-1}T^0$

C. $M^{-1}L^{-1}T^0$

D. $M^0L^0T^0$

Answer: B

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170. Find the dimensions of stress, strain and modulus of elasticity.

A. Force

B. Pressure

C. Work

D. $\frac{1}{\text{Pressure}}$

Answer: B

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171. The dimensions of pressure are

A. MLT^{-2}

B. $ML^{-2}T^{2}$

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

D. MLT^{2}

Answer: C

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172. Dimensions of permeability are

A. $A^{-2}M^{1}L^{1}T^{-2}$

B. MLT^{-2}

C. $ML^{0}T^{-1}$

D. $A^{-1}MLT^2$

Answer: A

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173. The dimensional formula for magnetic flux is

A. $ML^2T^{-2}A^{-1}$

B. $ML^0T^{-2}A^{-2}$

C. $M^0L^{-2}T^{-2}A^{-3}$

D. $ML^2T^{-2}A^3$

Answer: A

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174. If P represents radiation pressure , C represents the speed of light , and Q represents radiation energy striking a unit area per second , then non - zero integers x, y, z such that $P^x Q^y C^z$ is dimensionless , find the values of $x, y, \text{ and } z$.

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`

Answer: B

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175. Inductance L can be dimensional represented as

A. $ML^2T^{-2}A^{-2}$

B. $ML^2T^{-4}A^{-3}$

C. $ML^{-2}T^{-2}A^{-2}$

D. $ML^2T^4A^3$

Answer: A

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176. Find the dimensions of stress, strain and modulus of elasticity.

A. MLT^{-1}

B. ML^2T^{-1}

C. $MLT(-2)$

D. $M^0L^0T^0$

Answer: D

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177. Dimensions of time in power are

A. T^{-1}

B. T^{-2}

C. T^{-3}

D. T^{0}

Answer: C

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178. Dimensions of kinetic energy are

A. ML^2T^{-2}

B. M^2LT^{-1}

C. ML^2T^{-1}

D. ML^3T^{-1}

Answer: A

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179. The dimensional formula of torque is

A. L^2MT^{-2}

B. $L^{-1}MT^{-2}$

C. L^2MT^{-3}

D. LMT^{-2}

Answer: A

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180. Which one of the following represents the correct dimensions of the coefficient of viscosity?

A. ML^2T^{-2}

B. ML^2T^{-1}

C. $ML^{-1}T^{-1}$

D. MLT

Answer: C

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181. Find the dimension of the quantity L/(RCV), where symbols have usual meaning.

A. $[A]$

B. $[A^2]$

C. $[A^{-1}]$

D. None of these

Answer: C

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182. The dimensions of the ratio of angular momentum to linear momentum is

A. $M^0L^1T^0$

B. $M^1L^1T^{-1}$

C. $M^1L^2T^{-1}$

D. $M^{-1}L^{-1}T^{-1}$

Answer: A

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183. The pair having the same dimensions is

A. Angular momentum, work

B. Work, torque

C. Potential energy, linear momentum

D. Kinetic energy, velocity

Answer: B

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184. The dimensions of surface tension are

A. $ML^{-1}T^{-2}$

B. MLT^{-2}

C. $ML^{-1}T^{-1}$

D. MT^{-2}

Answer: D

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185. 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 elasticity

D. Torque and potential energy

Answer: A

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

A. $\frac{R}{L}$

B. $\frac{L}{R}$

C. $\sqrt{\frac{R}{L}}$

D. $\sqrt{\frac{L}{R}}$

Answer: A

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

A. $FA^{-1}v$

B. Fv^3A^{-2}

C. Fv^2A^{-1}

D. $F^2v^2A^{-1}$

Answer: B

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188. The dimensions of permittivity ε_0 are

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

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

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

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

Answer: B

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189. 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

Answer: D

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190. the dimensional formula for planck's constant and angular momentum are

A. ML^2T^{-1} and MLT^{-1}

B. ML^2T^{-1} and ML^2T^{-1}

C. MLT^{-1} and ML^2T^{-1}

D. MLT^{-1} and ML^2T^{-2}

Answer: B

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191. Let $[\varepsilon_0]$ denote the dimensional formula of the permittivity of the vacuum, and $[\mu_0]$ that of the permeability of the vacuum. If

$M = mass, L = \ \leq n > h, T = time$ and $I = e \leq ctriccurrent$

,

A. $[\varepsilon_0] = M^{-1}L^{-3}T^2I$

B. $[\varepsilon_0] = M^{-1}L^{-3}T^4I^2$

C. $[\mu_0] = MLT^{-2}I^{-2}$

D. $[\mu_0] = ML^2T^{-1}I$

Answer: B::C

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192. Dimension of CR are those of

A. Frequency

B. Energy

C. Time period

D. Current

Answer: C

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193. The physical quantity that has no dimensions is:

A. Angular Velocity

B. Linear momentum

C. Angular momentum

D. Strain

Answer: D

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194. $ML^{-1}T^{-2}$ represents

A. Stress

B. Young's Modulus

C. Pressure

D. All the above three quantities

Answer: D

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195. Dimensions of magnetic field intensity is

A. $\left[M^0L^{-1}T^0A^1\right]$

B. $\left[MLT^{-1}A^{-1}\right]$

C. $\left[ML^0T^{-2}A^{-1}\right]$

D. $\left[MLT^{-2}A\right]$

Answer: C

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196. The viscous force F on a sphere of radius a moving in a medium with velocity v is given by $F = 6\pi nav$. The dimension of η is

A. $ML^{-1}T^{-1}$

B. MT^{-1}

C. MLT^{-2}

D. ML^{-3}

Answer: A

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197. 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

Answer: A

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198. Two quantities A and B have different dimensions. Which mathematical operation given below is physically meaningful?

A. A/B

B. $A+B$

C. $A-B$

D. None

Answer: A

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

A. v^2 / rg

B. $v^2 r / g$

C. $v^2 g / r$

D. $v^2 rg$

Answer: A

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

A. Surface tension

B. Solar constant

C. Density

D. Compressibility

Answer: B

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201. A force F is given by $F = at + bt^2$, where t is time . What are the dimensions of a and b?

A. MLT^{-3} and ML^2T^{-4}

B. MLT^{-3} and MLT^{-4}

C. MLT^{-1} and MLT^0

D. MLT^{-4} and MLT^{-1}

Answer: B

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202. The dimensions of inter atomic force constant are

A. MT^{-2}

B. MLT^{-1}

C. MLT^{-2}

D. $ML^{-1}T^{-1}$

Answer: A

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203. If the speed of light c, acceleration due to gravity (g) and pressure (p) are taken as the fundamental quantities then the dimension of gravitational constant is

A. $c^2 g^0 p^{-2}$

B. $c^0 g^2 p^{-1}$

C. $c g^3 p^{-2}$

D. $c^{-1} g^0 p^{-1}$

Answer: B

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204. If the time period $(T)$of vibration of a liquid drop depends on surface tension (S) , radius(r) of the drop , and density (ρ) of the liquid , then find the expression of T.

A. $T = k\sqrt{\rho r^3 / S}$

B. $T = k\sqrt{\rho^{1/2}\frac{r^3}{S}}$

C. $T = k\sqrt{\rho\frac{r^3}{S^{1/2}}}$

D. None of these

Answer: A

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205. $ML^3T^{-1}Q^{-2}$ is dimension of

A. Resistivity

B. Conductivity

C. Resistance

D. None of these

Answer: A

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206. Dimension of electric current is

A. $\left[M^0L^0T^{-1}Q\right]$

B. $\left[ML^2T^{-1}Q\right]$

C. $\left[M^2LT^{-1}Q\right]$

D. $\left[M^2L^2T^{-1}Q\right]$

Answer: A

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207. The fundamental physical quantites quanties that have same dimension in the dimensional formula of Torque and Angular Momentum are

A. Mass, time

B. Time, length

C. Mass, length

D. Time, mole

Answer: C

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

A. PV^2T^2

B. $P^{-1}V^2T^{-2}$

C. PVT^2

D. $P^{-1}VT^2$

Answer: A

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209. The physical quantity which was the dimensional formula as that of $\frac{\text{energy}}{\text{mass} \times \text{length}}$ is

A. Force

B. Power

C. Pressure

D. Acceleration

Answer: D

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210. If velocity (V) , force (F), and energy (E) are taken as fundamental units , then find the dimensional formula for mass.

A. Ev^2

B. Ev^{-2}

C. Fv^{-1}

D. Fv^{-2}

Answer: B

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211. Dimensions of luminous flux are

A. ML^2T^{-2}

B. ML^2T^{-3}

C. ML^2T^{-1}

D. MLT^{-2}

Answer: B

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212. A physical quantity x depends on quantities y and z as follows : $x = Ay + B\tan(Cz)$, where A, B and C are constants. Which of the followings do not have the same dimensions?

A. x and b

B. C and z^{-1}

C. y and B/A

D. x and A

Answer: D

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213. 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

Answer: C

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214. 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 & moment of inertia

Answer: D

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215. 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

Answer: C

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216. The dimensional formula $M^0L^2T^{-2}$ stands for

A. Torque

B. Angular momentum

C. Latent heat

D. Coefficient of thermal conductivity

Answer: C

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217. Which of the following represents the dimensions of Farad

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

B. $ML^{2}T^{2}A^{-2}$

C. $ML^{2}T^{2}A^{-1}$

D. $MT^{-2}A^{-1}$

Answer: A

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

A. $\left[ML^{-2}T^{-1}I^0\right]$

B. $\left[M^0L^0T^3I^0\right]$

C. $\left[M^{-1}L^{-2}T^6I^2\right]$

D. $\left[M^0L^0T^2I^0\right]$

Answer: B

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219. 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. $c^{-1/2}G^{1/2}h^{1/2}$

Answer: C

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220. Dimensions of charge are

A. $M^0L^0T^{-1}A^{-1}$

B. $MLTA^{-1}$

C. $T^{-1}A$

D. TA

Answer: D

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221. According to Newton, the viscous force acting between liquid layers of area A and velocity gradient $\frac{\Delta v}{\Delta z}$ is given by $F = -\eta A \frac{dv}{dz}$, where η is constant called

A. $\left[ML^2T^{-2}\right]$

B. $\left[ML^{-1}T^{-1}\right]$

C. $\left[ML^{-2}T^{-2}\right]$

D. $\left[M^0L^0T^0\right]$

Answer: B

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222. Identify the pair whose dimensions are equal

A. Torque and work

B. Stress and energy

C. Force and stress

D. Force and work

Answer: A

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223. The dimensions of pressure is equal to

A. Force per unit volume

B. Energy per unit volume

C. Force

D. Energy

Answer: B

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224. Which of the two have same dimensions

A. Force and strain

B. Force and stress

C. Angular velocity and frequency

D. Energy and strain

Answer: C

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

A. $ML^{-1}T^{-1}$

B. MLT^{-1}

C. M^0LT^{-1}

D. ML^0T^{-1}

Answer: D

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226. The dimensions of emf in MKS is

A. $ML^{-1}T^{-2}Q^{-2}$

B. $ML^2T^{-2}Q^{-2}$

C. $MLT^{-2}Q^{-1}$

D. $ML^2T^{-2}Q^{-1}$

Answer: D

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227. Which of the following quantities is dimensionless

A. Gravitational constant

B. Planck's constant

C. Power of a convex lens

D. None

Answer: D

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228. The dimensional formula for Boltzmann's constant is

A. $\left[ML^2T^{-2}\theta^{-1}\right]$

B. $\left[ML^2T^{-2}\right]$

C. $\left[ML^0T^{-2}\theta^{-1}\right]$

D. $\left[ML^{-2}T^{-1}\theta^{-1}\right]$

Answer: A

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

A. $M^1L^0T^{-2}$

B. $M^0L^1T^{-1}$

C. $M^1L^1T^{-2}$

D. $M^1L^0T^{-1}$

Answer: A

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230. The physical quantities not having same dimensions are

A. Speed and $(\mu\varepsilon_0)^{-1/2}$

B. Torque and work

C. Momentum and Plank's constant

D. Stress and Young's modules

Answer: C

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231. Dimension of R is

A. ML^2T^{-1}

B. $ML^2T^{-3}A^{-2}$

C. $ML^{-1}T^{-2}$

D. None of these

Answer: B

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232. The dimensional formula of relative density is

A. ML^{-3}

B. LT^{-1}

C. MLT^{-2}

D. Dimensionless

Answer: D

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233. The dimensional formula for young's modulus is

A. $ML^{-1}T^{-2}$

B. M^0LT^{-2}

C. MLT^{-2}

D. ML^2T^{-2}

Answer: A

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234. 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. $k\rho^{\frac{1}{2}}a^{\frac{3}{2}}/T^{3/4}$

D. $k\rho^{1/2}a^{1/2}/T^{3/2}$

Answer: A

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235. The dimensions of electric potential are

A. $[ML^2T^{-2}Q^{-1}]$

B. $[MLT^{-2}Q^{-1}]$

C. $[ML^2T^{-1}Q]$

D. $[ML^2T^{-2}Q]$

Answer: A

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236. Dimensions of potential energy are

A. MLT^{-1}

B. ML^2T^{-2}

C. $ML^{-1}T^{-2}$

D. $ML^{-1}T^{-1}$

Answer: B

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237. The dimension of $\frac{R}{L}$ are

A. T^2

B. T

C. T^{-1}

D. T^{-2}

Answer: C

Watch Video Solution

238. The dimensions of shear modulus are

A. MLT^{-1}

B. ML^2T^{-2}

C. $ML^{-1}T^{-2}$

D. MLT^{-2}

Answer: C

Watch Video Solution

239. Presure gradient has the ssame dimension as that of

A. Velocity gradient

B. Potential gradient

C. Energy gradient

D. None of these

Answer: D

Watch Video Solution

240. If force F, Length L and time T are chosen as fundamental quantites, the dimensional formula for Mass is

A. $FL^{-1}T^{2}$

B. $FL^{-1}T^{-2}$

C. $FL^{-1}T^{-1}$

D. $FL^{2}T^{2}$

Answer: A

Watch Video Solution

241. The dimensions of universal gas constant is

A. $\left[ML^2T^{-2}\theta^{-1}\right]$

B. $\left[M^2LT^{-2}\theta\right]$

C. $\left[ML^3T^{-1}\theta^{-1}\right]$

D. None of these

Answer: A

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

A. $\left[M^0L^{-1}T^{-1}\right]$

B. $\left[M^0LT^{-1}\right]$

C. $\left[M^0L^{-1}T^0\right]$

D. $\left[M^0LT\right]$

Answer: C

Watch Video Solution

243. Position of a body with acceleration a is given by $x = Ka^mt^n$, here t is time Find demension of m and n.

A. $m = 1, n = 1$

B. $m = 1, n = 2$

C. $m = 2, n = 1$

D. $m = 2, n = 2$

Answer: B

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244. "Pascal-Second" has dimension of

A. Force

B. Energy

C. Pressure

D. Coefficient of viscosity

Answer: D

Watch Video Solution

245. 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

A. FA^2T

B. FAT^2

C. F^2AT

D. FAT

Answer: B

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246. Out of the following pair, which one NOT have identical dimensions is

A. Moment of inertia and moment of force

B. Work and torque

C. Angular momentum and Planck's constant

D. Impulse and momentum

Answer: A

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247. 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

Answer: A

Watch Video Solution

248. Which of the following group have different dimension

A. Potential difference, EMF, voltage

B. Pressure, stress, young's modulus

C. Heat, energy, work-done

D. Dipole moment, electric flux, electric field

Answer: D

View Text Solution

249. Out of following four dimensional quantities, which one quantity is 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

Answer: D

Watch Video Solution

250. Density of a liquid in CGS system is $0.625 \frac{g}{cm^3}$. What is its magnitude is SI system?

A. 0.625

B. 0.0625

C. 0.00625

D. 625

Answer: D

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251. 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 1 mm accuracy. The period is about 2 s. The time of 100 oscillation is measrued by a stop watch of least count 0.1 s. The percentage error is g is

A. 0.1%

B. 1%

C. 0.2%

D. 0.8%

Answer: C

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252. 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 KE obtained by measuring mass and speed?

A. 0.11

B. 0.08

C. 0.05

D. 0.01

Answer: B

Watch Video Solution

253. 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. $\frac{1}{2}x$

Answer: B

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254. What is the number of significant figures in 0.310×10^{-2}

A. 2

B. 3

C. 4

D. 6

Answer: B

Watch Video Solution

255. Errror in the measurement of radius of a sphere is 1% .The error in the calculated value of its volume is

A. 0.01

B. 0.03

C. 0.05

D. 0.07

Answer: B

Watch Video Solution

256. The mean time period of second's pendulum is 2.00 s 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. $(2.00 \pm 0.10)s$

Answer: C

Watch Video Solution

257. A body travels uniformly a distance of $(13.8 \pm 0.2)m$ in a time $(4.0 \pm 0.3)s$. Find the velocity of the body within error limits and the percentage error.

A. $(3.45 \pm 0.2)ms$

B. $(3.45 \pm 0.3)ms$

C. $(3.45 \pm 0.4)ms$

D. $(3.45 \pm 0.5)ms$

Answer: B

Watch Video Solution

258. 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

Answer: C

Watch Video Solution

259. The decimal equivalent of $\frac{1}{20}$ up to three significant figures is

A. 0.05

B. 0.05

C. 0.005

D. 5.0×10

Answer: A

Watch Video Solution

260. Accuracy of measurement is determined by

A. Absolute error

B. Percentage error

C. Both

D. None of these

Answer: B

Watch Video Solution

261. The radius of a sphere is (5.3 ± 0.1)cm` The perecentage error in its volume is

A. $\frac{0.1}{5.3} \times 1000$

B. $3 \times \frac{0.1}{5.3} \times 100$

C. $\frac{0.1 \times 100}{3.53}$

D. $\pm \frac{0.1}{5.3} \times 100$

Answer: B

Watch Video Solution

262. A thin copper wire of length l metre increases in length by 2% when heated through $10^{\circ}C$. What is the percentage increase in area when a square copper sheet of length l metre is heated through $10^{\circ}C$

A. 0.04

B. 0.08

C. 0.16

D. None of these

Answer: A

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263. In the context of accuracy of measurement and significant figures in expressing result 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

Answer: C

Watch Video Solution

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

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

Answer: D

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265. The relative density of material of a body is found by weighting it first in air and then in water . If the weight in air is $(5.00 \pm 0.05)N$ and the weight in water is $(4.00 \pm 0.05)N$. Find the relative density along with the maximum permissible percentage error.

A. $5.0 \pm 11\ \%$

B. $5.0 \pm 1\,\%$

C. $5.0 \pm 6\,\%$

D. $1.25 \pm 5\,\%$

Answer: A

Watch Video Solution

266. The resistance $R = V/i$, where $V = 100 \pm 5V$ and $I = 10 \pm 0.2A$. What is the total error in R?

A. $5\,\%$

B. $7\,\%$

C. $5.2\,\%$

D. $\frac{5}{2}\,\%$

Answer: B

Watch Video Solution

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

A. $0.1s$

B. $0.11s$

C. 0.01

D. $1.0s$

Answer: B

Watch Video Solution

268. 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. 0.01

B. 0.02

C. 0.03

D. 0.04

Answer: C

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269. In an experiment , the following observations were recorded:

$L = 2.820m, M = 3.00kg, l = 0.087cm, diameter, D = 0.041cm$. Taking $g = 9.81ms^{-2}$ and using the formula , $Y = \frac{4MgL}{\pi D^2 l}$, find the maximum permissible error in Y.

A. $7.96\ \%$

B. $4.56\ \%$

C. $6.50\ \%$

D. $8.42\ \%$

Answer: C

Watch Video Solution

270. 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 , find error in the measurement of H.

A. $\pm 17\ \%$

B. $\pm 16\ \%$

C. $\pm 19\ \%$

D. $\pm 25\ \%$

Answer: B

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271. If there is a positive error of $50\ \%$ in the measurement of velocity of a body , find the error in the measurement of kinetic

energy.

A. 0.25

B. 0.5

C. 1

D. 1.25

Answer: D

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272. A physical quantity P is given by $P = \frac{A^3 B^{1/2}}{C^{-4} D^{3/2}}$. Which quantity among $A, B, C,$ and D brings in the maximum percentage error in P?

A. A

B. B

C. C

D. D

Answer: C

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273. If $L = 2.331cm, B = 2.1cm$, then `L+B=

A. $4.431cm$

B. $4.43cm$

C. $4.4cm$

D. $4cm$

Answer: C

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274. 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

Answer: D

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275. If the length of rod A is 3.25 $\pm$ 0.01 cm and that of B is 4.19 $\pm$ 0.01 cm then the rod B is longer than rod A by

A. $0.94 \pm 0.00cm$

B. $0.94 \pm 0.01cm$

C. $0.94 \pm 0.02cm$

D. $0.94 \pm 0.005cm$

Answer: C

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276. A physical quantity is given by $X = M^aL^bT^c$. 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

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

Answer: A

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277. A physical quantity A is related to four observable a,b,c and d as follows, $A=\frac{a^2b^3}{c\sqrt{d}}$, the percentage errors of measurement is a,b,c and d,are 1% ,3% ,2% and 2% respectively. What is the percentage error in the quantity A?

A. 0.12

B. 0.07

C. 0.05

D. 0.14

Answer: D

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

A. 360000

B. 72000

C. 36000

D. 129600

Answer: D

Watch Video Solution

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

A. $\frac{1}{RC}$

B. $\frac{R}{L}$

C. $\frac{1}{\sqrt{LC}}$

D. $\frac{C}{L}$

Answer: D

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280. 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

A. M^0LT^2

B. $M^0L^2T^{-4}$

C. M^0LT^{-3}

D. $M^0L^2T^{-1}$

Answer: D

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281. 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

Answer: C

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282. If the dimenisons 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 Plank's constant respectively, then

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. $y = -\frac{3}{2}, z = \frac{1}{2}$

Answer: B::D

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283. A highly rigid cubical block A of small mass M and side L is fixed rigidly on the other cubical block of same dimensions and of 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 faces of A. After the force is withdrawn , block A exceutes small oscillations , the time period of which is given by

A. $2\pi\sqrt{\frac{M\eta}{L}}$

B. $2\pi\sqrt{\frac{L}{M\eta}}$

C. $2\pi\sqrt{\frac{ML}{\eta}}$

D. $2\pi\sqrt{\frac{M}{egaL}}$

Answer: D

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284. The pairs of physical quantities that have the same dimensions is (are):

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

Answer: A::B::C

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285. The speed of light (c), gravitational constant (G) and plank's constant (h) are taken as fundamental units in a system. The dimensions of time in this new system should be.

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. $G^{1/2}h^{1/2}c^{1/2}$

Answer: A

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286. 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. $h^{-1/2}c^{-3/2}G^{1/2}$

Answer: A

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287. $X = 3YZ^2$ find dimension of Y in (MKSA) system, if X and Z are the dimension 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. $M^{-3}L^{-2}T^{8}A^{4}$

Answer: D

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288. In the relation $P = \frac{\alpha}{\beta}e^{-\alpha z/k\theta}$, P is preesure, K is Botzmann's constant, Z is distance and θ is temperature. The dimensional formula of β wll be

A. $\left[M^{0}L^{2}T^{0}\right]$

B. $\left[M^{1}L^{2}T^{1}\right]$

C. $\left[M^{1}L^{0}T^{-1}\right]$

D. $\left[M^0L^2T^{-1}\right]$

Answer: A

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

A. $\left[M^0LT^{-1}\right]$

B. $\left[ML^0T^{-1}\right]$

C. $\left[ML^{-1}T^0\right]$

D. $\left[M^0L^0T^0\right]$

Answer: C

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290. Matching

(i) Curie	(A) MLT^{-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}

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

Answer: A

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

A. 1

B. 2

C. 3

D. 4

Answer: D

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292. 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

Answer: A

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293. Assertion : 'Light year' and 'Wavelength' both measure distance.

Reason : Both have dimensions of time.

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.

Answer: C

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

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

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.

Answer: D

Watch Video Solution

295. Assertion : Force cannot be added to pressure.

Reason : Because their dimensons are different.

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.

Answer: A

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

Reason : Because density is always mass per unit volume.

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.

Answer: C

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

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

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.

Answer: D

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298. Assertion : Units of Rydberge constant R are m^{-1}.

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

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.

Answer: A

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299. Assertion : Parallax method cannot be used for measuring distance of stars morer then 100 light year away.

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

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.

Answer: A

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300. Assertion : Number of significant figure in 0.005 is one and that is 0.500 is three

Reason : This is became zeros are not significant

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.

Answer: C

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301. Assersion : Out of three meansurements $l = 0.7m, l = 0.70m$ and $l = 0.700m$ the last one is most accurate.

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

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.

Answer: B

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302. Assertion : Mass, length and time are fundamental physical quantities.

Reason : They are independent of each other.

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.

Answer: A

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303. Assertion : Density is a derived physical quantity.

Reason : Density cannot be derived from the fundamental physical quantities.

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.

Answer: C

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304. Assertion : Now a days a standard metre is defined as in terms of the wavelength of light.

Reason : Light has no relation with length.

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.

Answer: C

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305. Assertion : Radar is used to detect an aeroplane in the sky

Reason : Radar works on the principle of reflection of waves.

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.

Answer: A

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306. Assertion : Surface tension and surface energy have the same dimensions.

Reason : Because both have the same S.I. unit

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.

Answer: C

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307. Assertion: In $y = A\sin(\omega t - kx), (\omega t - kx)$ is dimensionless.

Reason: Because dimension of $\omega = [M^0 L^0 T]$.

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.

Answer: C

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308. 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.

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 assertion is false but reason is true.

Answer: D

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309. Assertion : A.U. is much bigger than $\mathring{A}$.

Reason : A.U. stands for astronomical unit and $\mathring{A}$ stands from Angstrom.

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.

Answer: B

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310. Assertion: When we change the unit of measurerment of a quantity its numerical value changes.

Reason: Smaller the unit of measurement smaller is its numerical value.

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.

Answer: C

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311. Assertion: Dimensional constant are the quantites whose value are constant.

Reason: Dimensional constant are Dimensionless.

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.

Answer: C

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312. 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.

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 assertion is false but reason is true.

Answer: D

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313. 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 linear of time.

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.

Answer: B

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314. 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

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.

Answer: A

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315. Assertion : Avogadro number is the number of atoms in onegram mole.

Reason : Avogadro number is a dimensionless constant.

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.

Answer: C

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316. Assertion : L/R and CR both have same dimensions

Reason L/R and CR both have dimensions of time

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.

Answer: A

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317. Assertion: the quantity $\left(1/\sqrt{\mu_0\varepsilon_0}\right)$ is dimensionally equal to velocity and numerical equal to velocity of light.

Reason : μ_0 is permeability of free space and ε_0 is the permitivity of free space.

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.

Answer: B

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318. The surface tension of a liquid is $70\text{dyne}/cm$. In MKS system its value is

A. $70N/m$

B. $7 \times 10^{-2}N/m$

C. $7 \times 10^3 N/m$

D. $7 \times 10^2 N/m$

Answer:

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319. The SI unit of gravitational constant is

A. $\text{Watt} K^{-1} mol^{-1}$

B. $\text{Newton} K^{-1} mol^{-1}$

C. $\text{Joule} K^{-1} mol^{-1}$

D. $Erg K^{-1} mol^{-1}$

Answer:

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320. The unit of permittivity of free space ε_0 is:

A. $\text{Coulomb/Newton-metre}$

B. $\text{Newton}-\text{metere}^2/\text{Coulomb}^2$

C. $\text{Coulomb}^2/\left(\text{Newton-metre}^2\right)$

D. $\text{Coulomb}^2/\text{Newton}=\text{metre}^2$

Answer:

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321. The temperature of a body on Kelvin scale is found to be x K . When it is measured by Fahrenheit thermometer, it is found to be $x^\circ F$, then the value of x is

A. 301.25

B. 574.25

C. 313

D. 40

Answer:

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322. What are the units of $K\frac{1}{4\pi \in_0}$?

A. $C^2N^{-1}m^{-2}$

B. Nm^2C^{-2}

C. Nm^2C^2

D. Unitless

Answer:

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323. S.I. Unit of surface tension is:

A. Dyne/cm

B. Newton/cm

C. Newton/metre

D. Newton-metre

Answer:

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324. If $E, M, J,$ and G , respectively , denote energy , mass , angular momentum , and gravitational constant , then $EJ^2 / M^5 G^2$ has the dimensions of

A. Angle

B. Length

C. Mass

D. Time

Answer:

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325. From the equation $\tan\theta = \frac{rg}{v^2}$ one can obtain the angle of banking θ for a cyclise 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

Answer:

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326. A dimensionally consistent relation for the volume V of a liquid of coefficiet of viscosity η flowing per second through a tube of radius r and length l and having a pressure difference p across its end, is

A. $V = \frac{\pi p r^4}{8\eta l}$

B. $V = \frac{\pi \eta l}{8 p r^4}$

C. $V = \frac{8p\eta l}{\pi r^4}$

D. $V = \frac{\pi p \eta}{8 l r^4}$

Answer:

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327. The velocity v of a particle at time t is given by $v = at + \frac{b}{t + c}$, where a, b and c are constants. The dimensions of a, b, c are respectively :-

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. $a = L, b = LT, c = T^2$

Answer: C

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

A. $T = 2\pi\sqrt{\frac{R^3}{GM}}$

B. $T = 2\pi\sqrt{\frac{GM}{R^3}}$

C. $T = 2\pi\sqrt{\frac{GM}{R^{20}}}$

D. $T = 2\pi\sqrt{\frac{R^2}{GM}}$

Answer:

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329. The position of a particle at time t is given by the relation $x(t) = \left(\frac{v_0}{\alpha}\right)\left(1 - e^{-\alpha t}\right)$ where v_0 is a constant and $\alpha > 0$. Find the dimensions of v_0 and α

A. $M^0L^1T^{-1}$ and T^{-1}

B. $M^0L^1T^0$ and T^{-1}

C. $M^0L^1T^{-1}$ and LT^{-2}

D. $M^0L^1T^{-1}$ and T

Answer:

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330. The equation of state of some gases can be expressed as $\left(P + \frac{a}{V^2}\right) = \frac{R\theta}{V}$ where P is the pressure V the volume,θThe

temperature and a and b are constant .The dimensional formula of a is

A. $\left[ML^5T^{-2}\right]$

B. $\left[M^{-1}L^5T^{-2}\right]$

C. $\left[ML^{-1}T^{-2}\right]$

D. $\left[ML^{-5}T^{-2}\right]$

Answer: a

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331. The dimensins of $\frac{a}{b}$ in the equation $P = \frac{a - t^2}{bx}$ where P is pressure x is distance and t is time, are

A. MT^{-2}

B. M^2LT^{-3}

C. ML^3T^{-1}

D. LT^{-3}

Answer:

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332. Dimension of $\frac{1}{\mu_0\varepsilon_0}$, where symbols have usual meaning, are

A. $\left[LT^{-1}\right]$

B. $\left[L^{-1}T\right]$

C. $\left[L^{-2}T^2\right]$

D. $\left[L^2T^{-2}\right]$

Answer:

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333. The dimensions of $e^2/4\pi\varepsilon_0 hc$, where e, ε_0, h and c are electronic charge, electric permittivity, Planck's constant and velocity of light in vacuum respectively

A. $\left[M^0L^0T^0\right]$

B. $\left[M^1L^0T^0\right]$

C. $\left[M^0L^1T^0\right]$

D. $\left[M^0L^0T^1\right]$

Answer:

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334. The radius of a sphere is (5.3 ± 0.1)cm` The perecentage error in its volume is

A. $3 + 3.01 \times \frac{100}{5.3}$

B. $\frac{1}{3} \times 0.01 \times \frac{100}{5.3}$

C. $\left(\frac{3 \times 0.1}{5.3}\right) \times 100$

D. $\frac{0.1}{5.3} \times 100$

Answer:

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335. 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 measurement of force and length are respectively 4% and 2%, the maximum error in the measurement of pressure is

A. 0.01

B. 0.02

C. 0.06

D. 0.08

Answer:

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336. While measuring the acceleration due to gravity by a simple pendulum , a student makes a positive error of 1% in the length of the pendulum and a negative error of 3% in the value of time period . His percentage error in the measurement of g by the relation $g = 4\pi^2\left(l/T^2\right)$ will be

A. 0.02

B. 0.04

C. 0.07

D. 0.1

Answer:

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337. The length, breadth and thickness of a block are given by l=12 cm , b=6cm and t=2.45 cm. The volume of the block according to the idea of significant figures should be

A. $1 \times 10^2 cm^3$

B. $2 \times 10^2 cm^3$

C. $1.763 \times 10^2 cm^3$

D. None of these

Answer:

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