PHYSICS

BOOKS - MTG PHYSICS (ENGLISH)

UNITS AND MEASUREMENTS

Mcq S

1. In Internationan System of units, there are seven base quantities whose units are defined.

Which physical quatity has a prefix with its unit?

A. Mass

B. Thermodynamic temperature

C. Luminous intenstiy

D. Amount of substance

Answer: A

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2. The wrong unit conversation among the following is

A. 1 angstrom $= 10^{-10} cm$

B. 1 fermi $= 10^{-15} m$

C. 1 light year $= 9.46 \times 10^{15} m$

D. 1 astronomical unit $= 1.496 \times 10^{-11} m$

Answer: D

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3. Which of the following physical quantities has same unit in all the three system of units?

A. mass

B. lenth

C. time

D. none of these

Answer: C

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4. Which of the following is not the name of the physical quantity?

Time

impulse

mass

kilogram

A. Time

B. impulse

C. mass

D. kilogram

Answer: D

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5. Which one of the following physical quantities is not a fundamental quantity?

A. Luminious intensity

B. Thermodynamic temperature

C. Electric current

D. work

Answer: D

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6. Which one of the following statements is incorrect?

A. Direct and indirect methods are used for the measurement of physical quantities.

B. Scientific notation and the prefixes are used to simplify numberical computation.

C. A dimensionally correct equation need not be a correct equation.

D. The SI units is based on six base units.

Answer: D

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7. Which one of the following is not a unit of British system of units?

A. foot

B. metre

C. pound

D. second

Answer: B

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8. Which of the following is not a unit of time?

A. Parsec

B. Year

C. second

D. Hour

Answer: A

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9. Which one of the following is not a derived unit?

A. Joule

B. watt

C. Kilogram

D. newton

Answer: C

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10. Which of the following units is not a base unit?

A. metre

B. candala

C. ampere

D. pascal

Answer: D

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

A. CGS

B. FPS

C. MKS

D. SI

Answer: D

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12. In which year SI system of units was developed and recommended by General conference on weights and measures?

A. 1951

B. 1961

C. 1971

D. 1981

Answer: C

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13. Spot out the odd one.

A. Calorie

B. kilowatt hour

C. joule

D. watt

Answer: D

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14. Which of the following is unitless quantity?

A. Pressure gradient

B. Displacement gradient

C. force gradient

D. velocity gradient.

Answer: B

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15. Match the column I with Column II.

Column I (Physical quantity)		Column II (Name of unit)	
(A)	Conductance	(p)	gray
(B)	Magnetic induction	(q)	lumen
(C)	Absorbed dose	(r)	tesla
(D)	Luminous flux	(s)	siemens

A. A-s,B-r,C-p,D-q

B. A-p,B-q,C-r,D-s

C. A-q,B-p,C-s,D-r

D. A-r,B-s,C-p,D-q

Answer: A

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16. The SI unit of pressure gradient is

A. Nm^{-2}

B. Nm

C. Nm^{-1}

D. Nm^{-3}

Answer: D

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17. The relative density of lead is 11.3. its density $= \ldots\ldots gcm^{-3} = \ldots\ldots\ldots kgm^{-3}$. Fill in the blanks.

A. 1.13×10^3

B. 1.13×10^2

C. 1.13×10^4

D. 11.3

Answer: C

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18. The value of universal gravitational constant $G = 6.67 \times 10^{-11} Nm^2 kg^{-2}$. The value of G in units of $g^{-1} cm^3 s^{-2}$ is

A. 6.67×10^{-8}

B. 6.67×10^{-7}

C. 6.67×10^{-9}

D. 6.67×10^{-10}

Answer: A

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19. If the value of atmospheric pressure is 10^6 dyne cm^{-2}. Its value in SI units is:

A. 10^4 N m^{-2}

B. 10^6N m^{-2}

C. 10^5 N m^{-2}

D. 10^3 N m^{-2}

Answer: C

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20. The solid angle subtended by the periphery of an area $1cm^2$ at a point situtated symmetrically at a distance of 5 cm from the area is

A. 2×10^{-2} steradian

B. 4×10^{-2} steradian

C. 6×10^{-2} steradian

D. 8×10^{-2} steradian

Answer: B

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21. One barn is equal to

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

B. $10^{28}m^2$

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

D. $10^{30}m^2$

Answer: C

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22. Fathom is the unit to measure the

A. speed of ship

B. depth of sea

C. distance of the ship

D. speed of cyclone

Answer: B

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23. Which of the following is not unit of length?

A. asgstrom

B. fermi

C. barn

D. parsec

Answer: C

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24. Which of the following is smallest unit?

A. millimetre

B. angstrom

C. fermi

D. metre.

Answer: C

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25. Match the column I with Column II.

Column I		Column II	
(A)	Distance between earth and sun	(p)	Micron
(B)	Interatomic distance in a solid	(q)	Fermi
(C)	Size of a nucleus	(r)	Light year
(D)	Wavelength of infrared laser	(s)	Angstrom

A. A-p,B-q,C-r,D-s

B. A-r,B-s,C-q,D-p

C. A-q,B-p,C-s,D-r

D. A-s,B-r,C-p,D-q

Answer: B

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26. Which one of the following intruments is not used for the measurement of length?

Atomic clock

vernier callipers

Screw gauge

Spherometer

A. Atomic clock

B. varnier callipers

C. Screw gauge

D. Spherometer

Answer: A

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27. A new unit of length is chosen such that the speed of light in vacuum is unity. What is the distance between the sun and the earth in terms of the new unit, if light takes 8 min and 20 sec. to cover the distance ?

A. 300

B. 400

C. 500

D. 600

Answer: C

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28. Light year is :

A. light emitted by the sun in one year.

B. The time taken by light to travel from sun to earth.

C. The distance travelled by light in free space in one year.

D. The time taken by earth to go once around the sun.

Answer: C

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29. Light year is a unit of

A. Distance

B. time

C. speed

D. intensity of light

Answer: A

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30. How many light years alpha centauri away from the earth?

A. 1.29

B. 2.29

C. 3.29

D. 4.29

Answer: D

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31. Which one of the following methods is used to measure distance of a planet or a star from the earth?

A. Echo method

B. Parallax method

C. Triangulation method

D. none of these

Answer: B

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32. Laser beams are used to measure long distances because

A. it is very intense.

B. It is highly monochromatic.

C. It is an unidirectional beam of light.

D. All of these

Answer: D

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33. The distnace of the moon from the earth is about 60 times the radius of the earth. What will be diameter of the earth (approximately in degrees) as see from the moon?

A. 1°

B. 2°

C. 4°

D. 6°

Answer: B

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34. The sun's angular diameter is measured to be 1920''. The distance of the sun from the earth is $1.496 \times 10^{11} m$. What is the diameter of the sun?

A. $A. 1.39 \times 10^{9} m$

B. $B. 1.39 \times 10^{10} m$

C. $C. 1.39 \times 10^{11} m$

D. $D. 1.39 \times 10^{12}$m

Answer: A

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35. Calculate the length of the arc of a circle of radius 31.0 cm which subtands and angle of $\frac{\pi}{6}$ at the centre.

A. 11.7 cm

B. 14.7 cm

C. 16.7 cm

D. 15.7 cm

Answer: D

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36. The order of magnitude of the diameter of the earth is (diamtere of the earth is $1.28 \times 10^7 m$)

5

6

7

8

A. 5

B. 6

C. 7

D. 8

Answer: C

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37. How many wavelength of Kr^{86} are there is one metre

1553164.13

1650763.73

2348123.73

652189.63

A. 1553164.13

B. 1650763.73

C. 2348123.73

D. 652189.63

Answer: B

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38. The ratio of molar volume to atomic volume for 1 mole of hydrogen is (Take size of hydrogen molecule to be 1Ã...)

A. 7.1×10^4

B. 7.1×10^6

C. 7.1×10^{10}

D. 7.1×10^8

Answer: A

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39. If the size of bacteria is 1 micron, what will be the number of it in 1 m length?

A. One hundred

B. One crore

C. One thousand

D. One million

Answer: D

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40. One astronomical unit (AU) is equal to

A. $1.496 \times 10^{8} km$

B. $9.46 \times 10^{12} km$

C. $3.084 \times 10^{13} km$

D. $4.596 \times 10^{15} km$

Answer: A

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41. What is the ratio of volume of atom of the volume of nucleus?

A. 10^{10}

B. 10^{15}

C. 10^{20}

D. 10^{25}

Answer: B

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42. The ratio of one micron to one nanometre is

A. 10^{3}

B. 10^{-3}

C. 10^{-6}

D. 10^{-9}

Answer: A

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43. Which of the following conversions is incorrect?

A. 1 curie $= 3.7 \times 10^{10} g^{-1}$

B. 1 barn $= 10^{-25} m^2$

C. 1 quintal $= 100 kg$

D. 1 litre $= 10^{-3} m^3$

Answer: B

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44. the device used for measuring the mass of atoms and molecules is

A. spring balance

B. torsional balance

C. mass specrograph

D. common balance

Answer: C

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45. Which of the following statements is incorrect regarding mass?

A. it is a basic property of matter.

B. The SI unit of mass is kg.

C. The mass of an atom is expressed in u.

D. It depends upon the temperature, pressure or location of the object in space.

Answer: D

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46. Express unified atomic mass unit in kg.

A. $1.66 \times 10^{-25} kg$

B. $1.66 \times 10^{-27} kg$

C. $1.66 \times 10^{-29} kg$

D. $1.66 \times 10^{-31} kg$

Answer: B

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47. 10^{-3} gram is called

A. kilogram

B. milligram

C. decigram

D. microgram

Answer: B

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48. If the value of force is 100 N and vlaue of acceleration is 0.001 ms^{-2} what is the value of mass in this system of units?

A. $10^3 kg$

B. $10^4 kg$

C. $10^5 kg$

D. $10^6 kg$

Answer: C

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49. Match the column I with column II ltBrgt

Column I (Event)		Column II (Time interval) (s)	
(A)	Life time of an excited state of an atom	(p)	10^{17}
(B)	Average human life-span	(q)	10^{11}
(C)	Age of Egyptian pyramids	(r)	10^{9}
(D)	Age of the universe	(s)	10^{-8}

A. A-s,B-r,C-q,D-p

B. A-p,B-q,C-r,D-s

C. A-q,B-p,C-s,D-r

D. A-r,B-s,C-p,D-q

Answer: A

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50. One second is defined as

A. A. 1650763.73 perods of krypton clock

B. B. 652189.6 peridos of krypton clock

C. C. 1650763.73 periods of cesium clock

D. D. 9192631770 periods of cesium clock.

Answer: D

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51. Light from the sun reaches the earth approximately in

A. A.5s

B. B.50s

C. C. 500s

D. D. 0.5s

Answer: C

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52. The distance of a galaxy from the earth is of the order of $10^{25} m$. The time taken by light to reach the earth from the galaxy is

A. $A. 3 \times 10^{14} s$

B. $B. 3 \times 10^{16} s$

C. C. $3 \times 10^{18} s$

D. $D. 3 \times 10^{20} s$

Answer: B

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53. If the error in measuring the radius of the sphere is 2% and that in measuring its mass is 3%, Then the error in measuring the density of material of the sphere is:

A. 0.05

B. 0.07

C. 0.09

D. 0.11

Answer: C

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54. Which of the following is the most precise instrument for measuring length?

A. Metre rod of least count 0.1 cm

B. vernier callipers of least count 0.01 cm

C. Screw gauge of least count 0.001 cm

D. none of these

Answer: C

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55. Which of the following time measuring devices is most precise

A. A wall clock

B. An atomic clock

C. A digital watch

D. A stop watch.

Answer: B

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56. Which of the following statements is incorrect?

A. Every measurement by measuring instrument has some error.

B. A measurement can have more accuracy but less precision and vice versa.

C. Every calculated quantity that is based on measured values has some error.

D. The magnitude of the difference between the true value of the quantity and the individual measurement value is called the relative error of the measurement.

Answer: D

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57. Which of the followig inctruemnts has minium least count?

A. A screw gauge of pitch 1 mm and 100 divisions n the circular scale.

B. A spherrrometer of pitch 0.1 mm and 100 divisions on the circular scale.

C. An optical intrument that can measure length to within a wavelength of light.

D.

Answer: D

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58. The vernier scale of a travelling microscope has 50 divisions which coincide with 49 main scale divisions. If each main scale division is 0.5 mm, then the least count of the microscope is

A. 0.01 cm

B. 0.5 mm

C. 0.01 mm

D. 0.5 cm

Answer: C

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

A. 0.11 s

B. 0.12 s

C. 0.13 s

D. 0.14 s

Answer: A

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60. Find the relative error in Z, if $Z = A^4 B^{1/3} / CD^{3/2}$.

A.

$$\frac{\Delta Z}{Z} = 4\frac{\Delta A}{A} + \frac{1}{3}\frac{\Delta B}{B} + \frac{\Delta C}{C} + \frac{3}{2}\frac{\Delta D}{D}$$

B.

$$\frac{\Delta Z}{Z} = 4\frac{\Delta A}{A} + \frac{1}{3}\frac{\Delta B}{B} - \frac{\Delta C}{C} - \frac{3}{2}\frac{\Delta D}{D}$$

C.

$$\frac{\Delta Z}{Z} = 4\frac{\Delta A}{A} + \frac{1}{3}\frac{\Delta B}{B} + \frac{\Delta C}{C} - \frac{3}{2}\frac{\Delta D}{D}$$

D.

$$\frac{\Delta Z}{Z} = 4\frac{\Delta A}{A} + \frac{1}{3}\frac{\Delta B}{B} - \frac{\Delta C}{C} + \frac{3}{2}\frac{\Delta D}{D}$$

Answer: A

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61. The temperature of two bodies measured by a thermometer are $t_1 = 20^\circ C \pm 0.5^\circ C$ and $t_2 = 50^\circ C \pm 0.5^\circ C$. Calculate the temperature difference and error there in .

A. $30^\circ C \pm 1^\circ C$

B. $70^\circ C \pm 0.5^\circ C$

C. $30^\circ C \pm 0.5^\circ C$

D. $70^\circ C \pm 1^\circ C$

Answer: A

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62. Two resistors of resistances $R_1 = (300 \pm 3)\Omega$ and $R_2 = (500 \pm 4)\Omega$ are connected in series. The equivalent resistance of the series combination is

A. $(800 \pm 1)\Omega$

B. $(800 \pm 7)\Omega$

C. $(200 \pm 7)\Omega$

D. $(200 \pm 1)\Omega$

Answer: B

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63. Two resistances $R_1 = 100 \pm 3\Omega$ and $R_2 = 200 \pm 4\Omega$ are connected in series . Find the equivalent resistance of the series combination.

A. $(66.7 \pm 1.8)\Omega$

B. $(66.7 \pm 4.0)\Omega$

C. $(66.7 \pm 3.0)\Omega$

D. $(66.7 \pm 7.0)\Omega$

Answer: A

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64. Percentage erros in the measurement of mass and speed are 2% and 3% respectively. The error in the estimation of kinetic energy obtained by measuring mass and speed will be:

A. 0.08

B. 0.02

C. 0.12

D. 0.1

Answer: A

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65. A physical quantitiy X is related to four measurable quantities, a,b,c and d as give $X = a^2 b^3 c^{5/2} d^{-2}$. The percentage error in the measurement of a, b, c and d are

1%,2%,2% and 4% respectively. What is the percentage error in quantitiy X?

A. 0.15

B. 0.17

C. 0.21

D. 0.23

Answer: C

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66. The time period of a simple pendulum is given by $T = 2\pi\sqrt{L/g}$, where L is length and g acceleration due to gravity. Measured value of length is $10cm$ known to $1mm$ accuracy and time for 50 oscillations of the pendulum is 80 s using a wrist watch of 1 s resloution. What is the accuracy in the determination of g ?

A. 0.02

B. 0.03

C. 0.04

D. 0.05

Answer: D

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67. Which of the following statement is incorrect regarding significant figures?

A. All the non-zero digits are significant

B. All the zeros betwee two non-zero digits are significant

C. Greater the number of significant figrues in a measurement, smaller is the percentage error.

D. The power of 10 is counted while counting the number of significant figures.

Answer: D

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68. The value of resistance is 10.845Ω and the urrent is $3.23\tilde{A}\ldots$. On multiplying, we get the potential difference is 35.02935 V. the value of potential difference in terms of significant figures would be

A. 35V

B. 35.0V

C. 35.029 V

D. 35.03 V

Answer: B

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69. A cube has a side of length $1.2 \times 10^{-2}m$.

Calculate its volume

A. $1.7 \times 10^{-6}m^3$

B. $1.73 \times 10^{-6}m^3$

C. $1.78 \times 10^{-6}m^3$

D. $1.732 \times 10^{-6}m^3$

Answer: A

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70. The radius of a sphere is 1.41. its volume to an appropring number of significant figure is

A. $11.73cm^3$

B. $11.736cm^3$

C. $11.7cm^3$

D. $117cm^3$

Answer: C

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71. The mass of a box measured by a grocer's balance is 2.3 kg. Two gold pieces of masses 20.15 g and 20.17g are added to the box. What is (a) total mass of the box (b) the difference in masses of gold pieces to correct significant figures.

A. 2.3 kg

B. 2.34 kg

C. 2.340 kg

D. 2.3403 kg

Answer: A

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72. In the quastion number 71, what is the difference in the masses of the pieces?

A. 0.02 g

B. 0.021 g

C. 0.022 g

D. 0.024 g

Answer: A

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73. The numbers 3.845 and 3.835 on rounding off to 3 significant figures will give

A. 3.85 and 3.84

B. 3.84 and 3.83

C. 3.85 and 3.83

D. 3.84 and 3.84

Answer: D

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74. The respective number of significant figures for thenumbers 6.320, 6.032, 0.0006032 are

A. 3,4,8

B. 4,4,8

C. 4,4,4

D. 4,3,4

Answer: C

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75. The number of significant figures in the numbers 4.8000×10^4 and 48000.50 are respectively

A. 5 and 6

B. 5 and 7

C. 2 and 7

D. 2 and 6

Answer: B

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76. 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. $(3.5 \pm 0.6)ms^{-1}$

B. $(3.5 \pm 0.3)ms^{-1}$

C. $(6.1 \pm 0.6)ms^{-1}$

D. $(6.1 \pm 0.3)ms^{-1}$

Answer: B

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77. Which of the following physical quantities has a unit but no dimensions?

A. Relative velocity

B. Relative density

C. Strain

D. Angle

Answer: D

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78. Which of the following physical quantities has neither units nor dimensions?

A. 1. Relative velocity

B. 2. Relative density

C. 3. Angle

D. 4. Energy

Answer: B

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79. A dimensionless quantity

A. never has a unit

B. always has unit

C. may have a unit

D. does not exit

Answer: C

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80. Which of the following pairs of physical quantities have same dimensions?

A. Force and power

B. Torque and energy

C. Torque and power

D. Force and torque.

Answer: B

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81. If P,Q,R are physical quantities, having different dimensions, which of the following combinations can never be a meaningful quantity?

A. $\frac{(P-Q)}{R}$

B. $PQ-R$

C. $\frac{PQ}{R}$

D. $\dfrac{(PR - Q^2)}{R}$

Answer: A

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82. Which of the following sets have different dimensions?

A. Pressure, Young's modulus, stress

B. Emf, potential difference, electric potential

C. Heat, work done, energy

D. Dipole moment, electric flux, electric field.

Answer: D

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83. Match the column I with column II

Column I (Physical quantity)		Column II (Dimensional formula)	
(A)	Permittivity of free space	(p)	$[M^0L^0T^{-1}]$
(B)	Radiant flux	(q)	$[ML^3T^{-3}A^{-2}]$
(C)	Resistivity	(r)	$[ML^2T^{-3}]$
(D)	Hubble constant	(s)	$[M^{-1}L^{-3}T^4A^2]$

A. A-p,B-q,C-r,D-s

B. A-q,B-p,C-s,D-r

C. A-s,B-r,C-q,D-p

D. A-r,B-s,C-p,D-q

Answer: C

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

A. mass

B. length

C. time

D. angle

Answer: D

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85. If power (P), surface tension (S) and Planck's constant (h) are arranged so that the dimensions of time in their dimensional formulae are in ascending order, then which of the following is correct?

A. P,S,h

B. P,h,S

C. S,P,h

D. S,h,P

Answer: A

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86. The dimension of Planck's constant are the same as that of

A. charge

B. work

C. force

D. Angular momentum

Answer: D

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87. Match the column I with column II

Column I (Units)		Column II (Dimensional formulae)	
(A)	Pa s	(p)	$[M^0L^2T^{-2}K^{-1}]$
(B)	N m K^{-1}	(q)	$[MLT^{-3}K^{-1}]$
(C)	J kg^{-1} K^{-1}	(r)	$[ML^{-1}T^{-1}]$
(D)	W m^{-1} K^{-1}	(s)	$[ML^2T^{-2}K^{-1}]$

A. A-q,B-p,C-r,D-s

B. A-p,B-q,C_s,D-r

C. A-r,B-s,C-p,D-q

D. A-s,B-r,C-q,D-p

Answer: C

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88. The dimensional formula of electric potential is

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

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

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

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

Answer: A

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89. Dimensional formula of ΔQ, heat supplied to the system is:

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

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

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

D. $[MLT^1]$

Answer: A

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90. The dimensional formula of physical quantity is $[M^aL^bT^c]$.Then that physical quantity is

A. A. surface tension if a=1,b=1,c=-2

B. B. force if a=1,b=1,c=2

C. C. angular frequency if a=0,b=0,c=-1

D. D. spring constant if a=1,b=-1,c=-2

Answer: C

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91. Checking the correctness of equations using the method of dimensions is based on

A. the type of system

B. equality of inertial frames of references

C. principle of homogeneity of dimensions

D. none of these

Answer: C

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92. Using the principle of homogeneity of dimensions, which of the following is correct?

A. $T^2 = \frac{4\pi^2 r^3}{GM}$

B. $T^2 = 4\pi^2 r^2$

C. $T^2 = \frac{4\pi^2 r^3}{G}$

D. $T = \frac{4\pi^2 r^3}{G}$

Answer: A

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93. Which of the following relations is dimensionally incorrect?

A. $1u = 931.5$ MeV

B. 1u=931.5 MeV $/ c^2$

C. 1u=1.67 $\times 10^{-27} kg$

D. none of these

Answer: B

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94. On the basis of dimensions, decide which of the following relation for the displacement of a particle undergoing simple harmonic motion is not correct :

A. A.$y = a\sin\left(\frac{2\pi t}{T}\right)$

B. B. $y = a\cos\omega t$

C. C.$y = \frac{a}{T}\sin\left(\frac{t}{a}\right)$

D. D.$y = a\sqrt{2}\left(\sin\left(\frac{2\pi t}{T}\right) + \cos\left(\frac{2\pi t}{T}\right)\right)$

Answer: C

Watch Video Solution

95. The displacement of a progressive wave is represented by $y = A\sin(\omega t - kx)$ where x is distance and t is time. The dimensions of $\frac{\omega}{k}$ are same as those of

A. velocity

B. wave number

C. wavelength

D. frequency

Answer: A

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Watch Video Solution

96. If velocity of light c, planck's constant h and gravitational constnat G are taken as fundamental quantities then the dimensions of the length will be

A. $\sqrt{\frac{ch}{G}}$

B. $\sqrt{\frac{hG}{c^5}}$

C. $\sqrt{\frac{hG}{c^3}}$

D. $\sqrt{\frac{hc^3}{G}}$

Answer: C

Watch Video Solution

97. A new system of units is proposed in which unit of mass is αkg, unit of length β m and unit of time γs. How much will 5 J measure in this new system ?

A. $5\alpha\beta^2\gamma^{-2}$

B. $5\alpha^{-1}\beta^{-2}\gamma^2$

C. $5\alpha^{-2}\beta^{-1}\gamma^{-2}$

D. $5\alpha^{-1}\beta^2\gamma^2$

Answer: B

Watch Video Solution

98. If the energy, $E = G^p h^q c^r$, where G is the universal gravitational constant, h is the Planck's constant and c is the velocity of light, then the values of p are q and r are, respectively

A. $-1/2, 1/2$ and $5/2$

B. $1/2, \ -1/2 \text{ and } \ -5/2$

C. $-1/2, 1/2 \text{ and } 3/2$

D. $1/2, \ -1/2 \text{ and } \ -3/2$

Answer: A

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99. The equation fo state of a gas is given by $\left(P+\frac{a}{V^3}\right)(V-b^2)=cT$, where P,V,T are pressure, volume and temperature respectively, and a,b,c are constants. The dimesions of a and b are respectively

A. $\left[ML^8T^{-2}\right]$ and $\left[L^{3/2}\right]$

B. $\left[ML^5T^{-2}\right]$ and $\left[L^3\right]$

C. $\left[ML^5T^{-2}\right]$ and $\left[L^6\right]$

D. $\left[ML^6T^{-2}\right]$ and $\left[L^{3/2}\right]$

Answer: A

View Text Solution

100. The velocity of a paritcle (v) at an instant t is given by $v = at + bt^2$. The dimesion of b is

A. [L]

B. $[LT^{-1}]$

C. $[LT^{-2}]$

D. $[LT^{-3}]$

Answer: D

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Higher Order Thinking Skills

1. In the formula X=3YZ^(2), X and Z have dimension of capacitance and magnetic induction respectively. The dimensions of Y in MKSQ system are

A. 1. $\left[M^{-3}L^{-2}T^{4}Q^{4}\right]$

B. 2. $\left[M^{-2}L^{-1}T^{5}Q^{3}\right]$

C. 3. $\left[M^{-1}L^{-2}T^{4}Q^{4}\right]$

D. 4. $\left[M^{-3}L^{-1}T^{4}Q^{4}\right]$

Answer: A

Watch Video Solution

2. 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

Watch Video Solution

3. A student uses a simple pendulum of exactly $1m$ length to determine g, the acceleration due ti gravity. He uses a stop watch with the least count of $1\sec$ for this and record $40\sec onds$ for 20 oscillations for this observation, which of the following statement $(s) is (are)$ true?

A. Error ΔT in measuring T, the time period, is 0.05 seconds.

B. Error ΔT in measuring T, the time period, is 1 second.

C. Percentage error in the determination of g is 5%.

D. Both a and c

Answer: D

Watch Video Solution

4. The energy of a system as a function of time t is given as $E(t) = A^2 \exp(-\alpha t)$, $\alpha = 0.2 s^{-1}$. The measurement of A has an error of 1.25%. If the error In the measurement of time is 1.50%, the percentage error in the value of $E(t)$ at t = 5 s` is

A. 0.02

B. 0.04

C. 0.03

D. 0.05

Answer: B

Watch Video Solution

5. To find the distance d over which a signal can be seen clearly in foggy conditions, a railways engineer uses dimensional analysis and assumes that the distance depends on the mass density ρ of the fog, intensity (power / area) S of the light from the signal and its frequency f. The engineer finds that d is proportional to $S^{1/n}$. The value of n is.

A. 4

B. 2

C. 3

D. 1

Answer: C

View Text Solution

6. The dimensions of R in the equations $Q = Q_0\left(1 - e^{-t/RC}\right)$ are

A. $\left[ML^2T^{-3}A^{-2}\right]$

B. $\left[ML^2T^{-2}A^{-3}\right]$

C. $\left[M^2L^2T^{-3}A^{-2}\right]$

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

Answer: A

View Text Solution

7. Turpentine oil is flowing through a tube of length L and radius r. The pressure difference between the two ends of the tube is p , the viscosity of the coil is given by $\eta=\frac{p\left(r^2-x^2\right)}{4 v L}$, where v is the velocity of oil at a distance x from the axis of the tube. From this relation, the dimensions of viscosity η are

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

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

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

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

Answer: B

Watch Video Solution

8. A calorie is a unit of heat or energy and it equals about $4.2J, where 1J = 1kgm^2s^{-2}$. Suppose we employ a system of units in which the unit of mass equals αkg, the unit of length equals is βm , the unit of time is γs.

Show tthat a calorie has a magnitude $4.2\alpha^{-1}\beta^{-1}\gamma^2$ in terms of the new units.

A. $4.18\dfrac{\gamma^2}{\alpha\beta^2}$

B. $4.18\dfrac{\alpha\beta^2}{\gamma^2}$

C. $4.18\dfrac{\gamma^2}{\alpha}$

D. $4.18\dfrac{\beta^2}{\alpha\gamma^2}$

Answer: A

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9. The time period of oscillation of a body is given by $T = 2\pi\sqrt{\frac{mgA}{K}}$

K: Represents the kinetic energy, m mass, g acceleration due to gravity and A is unknown If $[A] = M^x L^y T^z$, then what is the value of x+y+z?

A. A. 3

B. B. 2

C. C. 1

D. D. 5

Answer: A

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10. The richardson equaction is given by $I = AT^2 e^{-B/kT}$. The dimensional formula for AB^2 is

A. 1. IT^(2)`

B. 2. kT

C. 3. Ik^2

D. 4. Ik^2/T

Answer: C

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Exemplar Problems

1. The number of significant figures in 0.06900 is

A. A. 5

B. B. 4

C. C. 2

D. D. 3

Answer: B

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2. The sum of the numbers 436.32, 227.2 and 0.301 in appropriate significant figures is

A. A. 663.821

B. B. 664

C. C. 663.8

D. D. 663.82

Answer: C

Watch Video Solution

3. The mass and volume of a body are 4.237 g and $2.5cm^3$, respectively. The density of the meterial of the body in correct significant figures is

A. $1.1.6948gcm^{-3}$

B. 2. $1.69gcm^{-3}$

C. 3. '$1.7gcm^{-3}$

D. 4. $1.695gcm^{-3}$

Answer: C

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4. The numbers 2.745 and 2.735 on rounding off to 3 significant figures will give

A. 2.75 and 2.74

B. 2.74 and 2.73

C. 2.75 and 2.73

D. 2.74 and 2.74

Answer: D

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5. The length and breadth of a rectangular sheet are 16.2 cm and 10.1cm, respectively. The area of the sheet in appropriate significant figures and error is

A. $164 \pm 3cm^2$

B. $163.62 \pm 2.6cm^2$

C. $163.6 \pm 2.6cm^2$

D. $163.62 \pm 3cm^2$

Answer: A

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6. Which of the following pairs of physical quantites does not have same dimensional formula ?

A. Work and torque

B. Angular momentum and Planck's constant.

C. Tension and surface tension.

D. Impulse and linear momentum.

Answer: C

Watch Video Solution

7. Measure of two quantities along with the precision of respective measuring instrument is $A = 2.5ms^{-1} \pm 0.5ms^{-1}$,B=0.10s+-0.01s`.

The value of AB will be

A. $(0.25 \pm 0.08)m$

B. $(0.25 \pm 0.5)m$

C. $(0.25 \pm 0.05)m$

D. $(0.25 \pm 0.135)m$

Answer: A

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8. You measure two quantities as $A = 1.0m \pm 0.2m, B = 2.0m \pm 0.2m$. We should report correct value for $\sqrt{AB}$ as

A. $1.4m \pm 0.4m$

B. $1.41m \pm 0.15m$

C. $1.4m \pm 0.3m$

D. $1.4m \pm 0.2m$

Answer: D

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9. which of the following measurements is most precise ?

A. 5.00 mm

B. 5.00 cm

C. 5.00 m

D. 5.00 kg

Answer: A

View Text Solution

10. The mean length of an object is 5 cm. Which of the following measurements is most accurate?

A. 4.9 cm

B. 4.805 cm

C. 5.25 cm

D. 5.4 cm

Answer: A

Watch Video Solution

11. Young's modulus of steel is $1.9 \times 10^{11} N / m^2$ When expressed is CGS units of $dynes / cm^2$ it will be equal to $(1N = 10^5 dyne, 1m^2 = 10^4 cm^2)$

A. 1.9×10^{10}

B. 1.9×10^{11}

C. 1.9×10^{12}

D. 1.9×10^{13}

Answer: C

Watch Video Solution

12. If momentum (p), area (A) and time$(t)$are taken to be fundamental quantities then energy has the dimensional formula

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

B. $\left[p^2 A^1 t^1\right]$

C. $\left[p^1 A^{1/2} t^1\right]$

D. $\left[p^1 A^{1/2} t^{-1}\right]$

Answer: D

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Assertion Reason

1. Assertion: The units of some physical quantities can be expressed as combination of the base units. ltbr. Reason: We need only a limited number of units for expressing the derived physical quantities.

A. if both assertion and reason are true reason is the correct explanation of assertion.

B. If both assertion and reason are true but reason is not the correct explanation fo assertion.

C. If assertion is true but reaso is false.

D. IF both assertion and reason are false.

Answer: A

Watch Video Solution

2. 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 reason is the correct explanation of assertion.

B. If both assertion and reason are true but reason is not the correct explanation fo assertion.

C. If assertion is true but reaso is false.

D. IF both assertion and reason are false.

Answer: C

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3. 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 reason is the correct explanation of assertion.

B. If both assertion and reason are true but reason is not the correct explanation fo

assertion.

C. If assertion is true but reaso is false.

D. IF both assertion and reason are false.

Answer: A

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4. Assertion: Light year is the distance that light travels with velocity of $3 \times 10^8 ms^{-1}$ in one year.

Reason: Light year is the unit for measuring time.

A. if both assertion and reason are true reason is the correct explanation of assertion.

B. If both assertion and reason are true but reason is not the correct explanation fo assertion.

C. If assertion is true but reaso is false.

D. IF both assertion and reason are false.

Answer: C

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5. Assertion: When percentage error in the meansurement of mass and velocity are 1% and 2% respectively the percentagwe error in K.E. is 5%.

Reason: $\frac{\Delta K}{K} = \frac{\Delta m}{m} = \frac{2\Delta v}{v}$.

A. if both assertion and reason are true reason is the correct explanation of

assertion.

B. If both assertion and reason are true but reason is not the correct explanation fo assertion.

C. If assertion is true but reaso is false.

D. IF both assertion and reason are false.

Answer: A

Watch Video Solution

6. Assertion: The number 1.202has four significant figure and the number 0.0024 has two significant figure.

Reason: All the zero digits are significant.

A. if both assertion and reason are true reason is the correct explanation of assertion.

B. If both assertion and reason are true but reason is not the correct explanation fo assertion.

C. If assertion is true but reaso is false.

D. IF both assertion and reason are false.

Answer: B

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7. Assertion: A number 2.746 rounded off to three significant figures is 2.75, while the number 2.743 would be 2.74.

Reason: In rounding off the uncertain digits, the preceding digit is raised by 1 if the insignificant digit to be dropped is more than 5 and is left unchanged if the latter is less than 5.

A. if both assertion and reason are true reason is the correct explanation of assertion.

B. If both assertion and reason are true but reason is not the correct explanation fo assertion.

C. If assertion is true but reaso is false.

D. IF both assertion and reason are false.

Answer: A

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8. Assertion: The given equation $x = x_0 + u_0 t + \frac{1}{2} a t^2$ is dimensionally correct, where x is the distance travelled by a particle in time t , initial position x_0 initial velocity u_0 and uniform acceleration a is along the direction of motion.

Reason: Dimensional analysis can be used for cheking the dimensional consistency or homogenetly of the equation.

A. if both assertion and reason are true reason is the correct explanation of assertion.

B. If both assertion and reason are true but reason is not the correct explanation fo assertion.

C. If assertion is true but reaso is false.

D. IF both assertion and reason are false.

Answer: A

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9. Assertion: A dimensionally wrong or inconsistaent equation must be wrong.

Reason: A dimensionally consistent equation is a exact or a correct equation.

A. if both assertion and reason are true reason is the correct explanation of assertion.

B. If both assertion and reason are true but reason is not the correct explanation fo assertion.

C. If assertion is true but reaso is false.

D. IF both assertion and reason are false.

Answer: C

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10. Assertion: Force can be added to pressure.

Reason: Force and pressure have same dimensions.

A. if both assertion and reason are true reason is the correct explanation of assertion.

B. If both assertion and reason are true but reason is not the correct explanation fo assertion.

C. If assertion is true but reaso is false.

D. IF both assertion and reason are false.

Answer: D

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

Reason : Both have dimensions of time.

A. if both assertion and reason are true reason is the correct explanation of assertion.

B. If both assertion and reason are true but reason is not the correct explanation fo assertion.

C. If assertion is true but reaso is false.

D. IF both assertion and reason are false.

Answer: C

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12. Assertion: Pressure can not be subtracted from pressure gradient.

Reason: Pressure and pressure gradient have different dimensions.

A. if both assertion and reason are true reason is the correct explanation of assertion.

B. If both assertion and reason are true but reason is not the correct explanation fo

assertion.

C. If assertion is true but reaso is false.

D. IF both assertion and reason are false.

Answer: A

Watch Video Solution

13. Assertion: Both velocity and pseed have same dimesions.

Reason: Velocity cannot be added to speed.

A. if both assertion and reason are true reason is the correct explanation of assertion.

B. If both assertion and reason are true but reason is not the correct explanation fo assertion.

C. If assertion is true but reaso is false.

D. IF both assertion and reason are false.

Answer: B

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14. Assertion: The dimensional formula of surface energy is $[M^1L^2T^{-2}]$. Reason: Surface energy has same dimensions as that of potential energy.

A. if both assertion and reason are true reason is the correct explanation of assertion.

B. If both assertion and reason are true but reason is not the correct explanation fo

assertion.

C. If assertion is true but reaso is false.

D. IF both assertion and reason are false.

Answer: B

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15. Assertion: Angle and angular displacement a dimensionless quantities.

Reason: Angle is equal in arc length divided by radius.

A. if both assertion and reason are true reason is the correct explanation of assertion.

B. If both assertion and reason are true but reason is not the correct explanation fo assertion.

C. If assertion is true but reaso is false.

D. IF both assertion and reason are false.

Answer: A

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The International System Of Units

1. In Internationan System of units, there are seven base quantities whose units are defined. Which physical quatity has a prefix with its unit?

A. Mass

B. Thermodynamic temperature

C. Luminous intenstiy

D. Amount of substance

Answer: A

View Text Solution

2. The wrong unit conversation among the following is

A. 1 angstrom $= 10^{-10} cm$

B. 1 fermi $= 10^{-15} m$

C. 1 light year $= 9.46 \times 10^{15} m$

D. 1 astronomical unit $= 1.496 \times 10^{-11} m$

Answer: D

Watch Video Solution

3. Which of the following physical quantities has same unit in all the three system of units?

A. mass

B. lenth

C. time

D. none of these

Answer: C

Watch Video Solution

4. Which of the following is not the name of the physical quantity?

Time

impulse

mass

kilogram

A. Time

B. impulse

C. mass

D. kilogram

Answer: D

Watch Video Solution

5. Which one of the following physical quantities is not a fundamental quantity?

A. Luminious intensity

B. Thermodynamic temperature

C. Electric current

D. work

Answer: D

Watch Video Solution

6. Which one of the following statements is incorrect?

A. Direct and indirect methods are used for the measurement of physical quantities.

B. Scientific notation and the prefixes are used to simplify numberical computation.

C. A dimensionally correct equation need not be a correct equation.

D. The SI units is based on six base units.

Answer: D

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7. Which one of the following is not a unit of British system of units?

A. foot

B. metre

C. pound

D. second

Answer: B

Watch Video Solution

8. Which of the following is not a unit of time?

A. Parsec

B. Year

C. second

D. Hour

Answer: A

Watch Video Solution

9. Which one of the following is not a derived unit?

A. Joule

B. watt

C. Kilogram

D. newton

Answer: C

Watch Video Solution

10. Which of the following units is not a base unit?

A. metre

B. candala

C. ampere

D. pascal

Answer: D

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

A. CGS

B. FPS

C. MKS

D. SI

Answer: D

Watch Video Solution

12. In which year SI system of units was developed and recommended by General conference on weights and measures?

A. 1951

B. 1961

C. 1971

D. 1981

Answer: C

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13. Spot out the odd one.

A. Calorie

B. kilowatt hour

C. joule

D. watt

Answer: D

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14. Which of the following is unitless quantity?

A. Pressure gradient

B. Displacement gradient

C. force gradient

D. velocity gradient.

Answer: B

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15. Match the column I with Column II.

	Column I (Physical quantity)		Column II (Name of unit)
(A)	Conductance	(p)	gray
(B)	Magnetic induction	(q)	lumen
(C)	Absorbed dose	(r)	tesla
(D)	Luminous flux	(s)	siemens

A. A-s,B-r,C-p,D-q

B. A-p,B-q,C-r,D-s

C. A-q,B-p,C-s,D-r

D. A-r,B-s,C-p,D-q

Answer: A

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16. The SI unit of pressure gradient is

A. Nm^{-2}

B. Nm

C. Nm^{-1}

D. Nm^{-3}

Answer: D

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17. The relative density of lead is 11.3. its density $= \ldots\ldots gcm^{-3} = \ldots\ldots\ldots kgm^{-3}$. Fill in the blanks.

A. 1.13×10^3

B. 1.13×10^2

C. 1.13×10^4

D. 11.3

Answer: C

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18. The value of universal gravitational constant $G = 6.67 \times 10^{-11} Nm^2 kg^{-2}$. The value of G in units of $g^{-1} cm^3 s^{-2}$ is

A. 6.67×10^{-8}

B. 6.67×10^{-7}

C. 6.67×10^{-9}

D. 6.67×10^{-10}

Answer: A

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19. If the value of atmospheric pressure is 10^6 dyne cm^{-2}. Its value in SI units is:

A. 10^4 N m^{-2}

B. 10^6N m^{-2}

C. 10^5 N m^{-2}

D. 10^3 N m^{-2}

Answer: C

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20. The solid angle subtended by the periphery of an area $1cm^2$ at a point situtated symmetrically at a distance of 5 cm from the area is

A. 2×10^{-2} steradian

B. 4×10^{-2} steradian

C. 6×10^{-2} steradian

D. 8×10^{-2} steradian

Answer: B

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21. One barn is equal to

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

B. $10^{28}m^2$

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

D. $10^{30}m^2$

Answer: C

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Measurement Of Length

1. Fathom is the unit to measure the

A. speed of ship

B. depth of sea

C. distance of the ship

D. speed of cyclone

Answer: B

Watch Video Solution

2. Which of the following is not unit of length?

A. asgstrom

B. fermi

C. barn

D. parsec

Answer: C

Watch Video Solution

3. Which of the following is smallest unit?

A. millimetre

B. angstrom

C. fermi

D. metre.

Answer: C

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4. Match the column I with Column II.

Column I		Column II	
(A)	Distance between earth and sun	(p)	Micron
(B)	Interatomic distance in a solid	(q)	Fermi
(C)	Size of a nucleus	(r)	Light year
(D)	Wavelength of infrared laser	(s)	Angstrom

A. A-p,B-q,C-r,D-s

B. A-r,B-s,C-q,D-p

C. A-q,B-p,C-s,D-r

D. A-s,B-r,C-p,D-q

Answer: B

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5. Which one of the following intruments is not used for the measurement of length?

Atomic clock

vernier callipers

Screw gauge

Spherometer

A. Atomic clock

B. varnier callipers

C. Screw gauge

D. Spherometer

Answer: A

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6. A new unit of length is chosen such that the speed of light in vacuum is unity. What is the distance between the sun and the earth in terms of the new unit, if light takes 8 min and 20 sec. to cover the distance ?

A. 300

B. 400

C. 500

D. 600

Answer: C

View Text Solution

7. Light year is :

A. light emitted by the sun in one year.

B. The time taken by light to travel from sun to earth.

C. The distance travelled by light in free space in one year.

D. The time taken by earth to go once around the sun.

Answer: C

View Text Solution

8. Light year is a unit of

A. Distance

B. time

C. speed

D. intensity of light

Answer: A

View Text Solution

9. How many light years alpha centauri away from the earth?

A. 1.29

B. 2.29

C. 3.29

D. 4.29

Answer: D

Watch Video Solution

10. Which one of the following methods is used to measure distance of a planet or a star from the earth?

A. Echo method

B. Parallax method

C. Triangulation method

D. none of these

Answer: B

Watch Video Solution

11. Laser beams are used to measure long distances because

A. it is very intense.

B. It is highly monochromatic.

C. It is an unidirectional beam of light.

D. All of these

Answer: D

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12. The distnace of the moon from the earth is about 60 times the radius of the earth. What will be diameter of the earth (approximately in degrees) as see from the moon?

A. 1°

B. 2°

C. 4°

D. 6°

Answer: B

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13. The sun's angular diameter is measured to be 1920''. The distance of the sun from the earth is $1.496 \times 10^{11} m$. What is the diameter of the sun?

A. $1.39 \times 10^{9} m$

B. $1.39 \times 10^{10} m$

C. $1.39 \times 10^{11} m$

D. 1.39×10^{12}m

Answer: A

Watch Video Solution

14. Calculate the length of the arc of a circle of radius 31.0 cm which subtands and angle of $\frac{\pi}{6}$ at the centre.

A. 11.7 cm

B. 14.7 cm

C. 16.7 cm

D. 15.7 cm

Answer: D

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15. The order of magnitude of the diameter of the earth is (diamtere of the earth is $1.28 \times 10^7 m$)

5

6

7

8

A. 5

B. 6

C. 7

D. 8

Answer: C

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16. How many wavelength of Kr^{86} are there is one metre

1553164.13

1650763.73

2348123.73

652189.63

A. 1553164.13

B. 1650763.73

C. 2348123.73

D. 652189.63

Answer: B

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17. The ratio of molar volume to atomic volume for 1 mole of hydrogen is (Take size of hydrogen molecule to be 1Ã…)

A. 7.1×10^{4}

B. 7.1×10^{6}

C. 7.1×10^{10}

D. 7.1×10^{8}

Answer: A

View Text Solution

18. If the size of bacteria is 1 micron, what will be the number of it in 1 m length?

A. One hundred

B. One crore

C. One thousand

D. One million

Answer: D

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19. One astronomical unit (AU) is equal to

A. $1.496 \times 10^{8} km$

B. $9.46 \times 10^{12} km$

C. $3.084 \times 10^{13} km$

D. $4.596 \times 10^{15} km$

Answer: A

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20. What is the ratio of volume of atom of the volume of nucleus?

A. 10^{10}

B. 10^{15}

C. 10^{20}

D. 10^{25}

Answer: B

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21. The ratio of one micron to one nanometre is

A. 10^3

B. 10^{-3}

C. 10^{-6}

D. 10^{-9}

Answer: A

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22. Which of the following conversions is incorrect?

A. 1 curie $= 3.7 \times 10^{10} g^{-1}$

B. 1 barn $= 10^{-25} m^2$

C. 1 quintal $= 100 kg$

D. 1 litre $= 10^{-3} m^3$

Answer: B

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Measurement Of Mass

1. the device used for measuring the mass of atoms and molecules is

A. spring balance

B. torsional balance

C. mass specrograph

D. common balance

Answer: C

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2. Which of the following statements is incorrect regarding mass?

A. it is a basic property of matter.

B. The SI unit of mass is kg.

C. The mass of an atom is expressed in u.

D. It depends upon the temperature, pressure or location of the object in space.

Answer: D

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3. Express unified atomic mass unit in kg.

A. $1.66 \times 10^{-25} kg$

B. $1.66 \times 10^{-27} kg$

C. $1.66 \times 10^{-29} kg$

D. $1.66 \times 10^{-31} kg$

Answer: B

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4. 10^{-3} gram is called

A. kilogram

B. milligram

C. decigram

D. microgram

Answer: B

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5. If the value of force is 100 N and vlaue of acceleration is 0.001 ms^{-2} what is the value of mass in this system of units?

A. $10^3 kg$

B. $10^4 kg$

C. $10^5 kg$

D. $10^6 kg$

Answer: C

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6. Match the column I with column II ltBrgt

Column I (Event)		Column II (Time interval) (s)	
(A)	Life time of an excited state of an atom	(p)	10^{17}
(B)	Average human life-span	(q)	10^{11}
(C)	Age of Egyptian pyramids	(r)	10^{9}
(D)	Age of the universe	(s)	10^{-8}

A. A-s,B-r,C-q,D-p

B. A-p,B-q,C-r,D-s

C. A-q,B-p,C-s,D-r

D. A-r,B-s,C-p,D-q

Answer: A

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7. One second is defined as

A. 1650763.73 perods of krypton clock

B. 652189.6 peridos of krypton clock

C. 1650763.73 periods of cesium clock

D. 9192631770 periods of cesium clock.

Answer: D

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8. Light from the sun reaches the earth approximately in

A. 5s

B. 50s

C. 500s

D. 0.5s

Answer: C

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9. The distance of a galaxy from the earth is of the order of $10^{25} m$. The time taken by light to reach the earth from the galaxy is

A. $3 \times 10^{14} s$

B. $3 \times 10^{16} s$

C. $3 \times 10^{18} s$

D. $3 \times 10^{20} s$

Answer: B

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Accuracy Precision Of Instruments And Errors In Measurements

1. If the error in measuring the radius of the sphere is 2% and that in measuring its mass is 3%, Then the error in measuring the density of material of the sphere is:

A. 0.05

B. 0.07

C. 0.09

D. 0.11

Answer: C

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2. Which of the following is the most precise instrument for measuring length?

A. Metre rod of least count 0.1 cm

B. vernier callipers of least count 0.01 cm

C. Screw gauge of least count 0.001 cm

D. none of these

Answer: C

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3. Which of the following time measuring devices is most precise

A. A wall clock

B. An atomic clock

C. A digital watch

D. A stop watch.

Answer: B

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4. Which of the following statements is incorrect?

A. Every measurement by measuring instrument has some error.

B. A measurement can have more accuracy but less precision and vice versa.

C. Every calculated quantity that is based on measured values has some error.

D. The magnitude of the difference between the true value of the quantity and the individual measurement value is called the relative error of the measurement.

Answer: D

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5. Which of the followig inctruemnts has minium least count?

A. A screw gauge of pitch 1 mm and 100 divisions n the circular scale.

B. A spherrrometer of pitch 0.1 mm and 100 divisions on the circular scale.

C. An optical intrument that can measure length to within a wavelength of light.

D.

Answer: D

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6. The vernier scale of a travelling microscope has 50 divisions which coincide with 49 main scale divisions. If each main scale division is 0.5 mm, then the least count of the microscope is

A. 0.01 cm

B. 0.5 mm

C. 0.01 mm

D. 0.5 cm

Answer: C

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

A. 0.11 s

B. 0.12 s

C. 0.13 s

D. 0.14 s

Answer: A

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8. Find the relative error in Z, if $Z = A^4 B^{1/3} / C D^{3/2}$.

A.

$$\frac{\Delta Z}{Z} = 4\frac{\Delta A}{A} + \frac{1}{3}\frac{\Delta B}{B} + \frac{\Delta C}{C} + \frac{3}{2}\frac{\Delta D}{D}$$

B.

$$\frac{\Delta Z}{Z} = 4\frac{\Delta A}{A} + \frac{1}{3}\frac{\Delta B}{B} - \frac{\Delta C}{C} - \frac{3}{2}\frac{\Delta D}{D}$$

C.

$$\frac{\Delta Z}{Z} = 4\frac{\Delta A}{A} + \frac{1}{3}\frac{\Delta B}{B} + \frac{\Delta C}{C} - \frac{3}{2}\frac{\Delta D}{D}$$

D.

$$\frac{\Delta Z}{Z} = 4\frac{\Delta A}{A} + \frac{1}{3}\frac{\Delta B}{B} - \frac{\Delta C}{C} + \frac{3}{2}\frac{\Delta D}{D}$$

Answer: A

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9. The temperature of two bodies measured by a thermometer are $t_1 = 20^\circ C \pm 0.5^\circ C$ and $t_2 = 50^\circ C \pm 0.5^\circ C$. Calculate the temperature difference and error there in .

A. $30^\circ C \pm 1^\circ C$

B. $70^\circ C \pm 0.5^\circ C$

C. $30^\circ C \pm 0.5^\circ C$

D. $70^\circ C \pm 1^\circ C$

Answer: A

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10. Two resistors of resistances $R_1 = (300 \pm 3)\Omega$ and $R_2 = (500 \pm 4)\Omega$ are connected in series. The equivalent resistance of the series combination is

A. $(800 \pm 1)\Omega$

B. $(800 \pm 7)\Omega$

C. $(200 \pm 7)\Omega$

D. $(200 \pm 1)\Omega$

Answer: B

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11. Two resistances $R_1 = 100 \pm 3\Omega$ and $R_2 = 200 \pm 4\Omega$ are connected in series . Find the equivalent resistance of the series combination.

A. $(66.7 \pm 1.8)\Omega$

B. $(66.7 \pm 4.0)\Omega$

C. $(66.7 \pm 3.0)\Omega$

D. $(66.7 \pm 7.0)\Omega$

Answer: A

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12. Percentage erros in the measurement of mass and speed are 2% and 3% respectively. The error in the estimation of kinetic energy obtained by measuring mass and speed will be:

A. 0.08

B. 0.02

C. 0.12

D. 0.1

Answer: A

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13. A physical quantitiy X is related to four measurable quantities, a,b,c and d as give $X = a^2 b^3 c^{5/2} d^{-2}$. The percentage error in the measurement of a, b, c and d are

1%,2%,2% and 4% respectively. What is the percentage error in quantitiy X?

A. 0.15

B. 0.17

C. 0.21

D. 0.23

Answer: C

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14. The time period of a simple pendulum is given by $T = 2\pi\sqrt{L/g}$, where L is length and g acceleration due to gravity. Measured value of length is $10cm$ known to $1mm$ accuracy and time for 50 oscillations of the pendulum is 80 s using a wrist watch of 1 s resloution. What is the accuracy in the determination of g ?

A. 0.02

B. 0.03

C. 0.04

D. 0.05

Answer: D

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Significant Figures

1. Which of the following statement is incorrect regarding significant figures?

A. All the non-zero digits are significant

B. All the zeros betwee two non-zero digits are significant

C. Greater the number of significant figrues in a measurement, smaller is the percentage error.

D. The power of 10 is counted while counting the number of significant figures.

Answer: D

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2. The value of resistance is 10.845Ω and the urrent is $3.23 \tilde{\mathrm{A}} \ldots$. On multiplying, we get the potential difference is 35.02935 V. the value of potential difference in terms of significant figures would be

A. 35V

B. 35.0V

C. 35.029 V

D. 35.03 V

Answer: B

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3. A cube has a side of length $1.2 \times 10^{-2} m$.

Calculate its volume

A. $1.7 \times 10^{-6} m^3$

B. $1.73 \times 10^{-6} m^3$

C. $1.78 \times 10^{-6} m^3$

D. $1.732 \times 10^{-6} m^3$

Answer: A

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4. The radius of a sphere is 1.41. its volume to an appropring number of significant figure is

A. $11.73cm^3$

B. $11.736cm^3$

C. $11.7cm^3$

D. $117cm^3$

Answer: C

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5. The mass of a box measured by a grocer's balance is 2.3 kg. Two gold pieces of masses 20.15 g and 20.17g are added to the box. What is (a) total mass of the box (b) the difference in masses of gold pieces to correct significant figures.

A. 2.3 kg

B. 2.34 kg

C. 2.340 kg

D. 2.3403 kg

Answer: A

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6. In the quastion number 71, what is the difference in the masses of the pieces?

A. 0.02 g

B. 0.021 g

C. 0.022 g

D. 0.024 g

Answer: A

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7. The numbers 3.845 and 3.835 on rounding off to 3 significant figures will give

A. 3.85 and 3.84

B. 3.84 and 3.83

C. 3.85 and 3.83

D. 3.84 and 3.84

Answer: D

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8. The respective number of significant figures for thenumbers 6.320, 6.032, 0.0006032 are

A. 3,4,8

B. 4,4,8

C. 4,4,4

D. 4,3,4

Answer: C

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9. The number of significant figures in the numbers 4.8000×10^4 and 48000.50 are respectively

A. 5 and 6

B. 5 and 7

C. 2 and 7

D. 2 and 6

Answer: B

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10. 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. $(3.5 \pm 0.6) ms^{-1}$

B. $(3.5 \pm 0.3) ms^{-1}$

C. $(6.1 \pm 0.6) ms^{-1}$

D. $(6.1 \pm 0.3) ms^{-1}$

Answer: B

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Dimensions Of Physical Quantities

1. Which of the following physical quantities has a unit but no dimensions?

A. Relative velocity

B. Relative density

C. Strain

D. Angle

Answer: D

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2. Which of the following physical quantities has neither units nor dimensions?

A. 1. Relative velocity

B. 2. Relative density

C. 3. Angle

D. 4. Energy

Answer: B

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3. A dimensionless quantity

A. never has a unit

B. always has unit

C. may have a unit

D. does not exit

Answer: C

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4. Which of the following pairs of physical quantities have same dimensions?

A. Force and power

B. Torque and energy

C. Torque and power

D. Force ad torque.

Answer: B

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5. If P,Q,R are physical quantities, having different dimensions, which of the following combinations can never be a meaningful quantity?

A. $\frac{(P-Q)}{R}$

B. $PQ - R$

C. $\frac{PQ}{R}$

D. $\frac{(PR-Q^2)}{R}$

Answer: A

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6. Which of the following sets have different dimensions?

A. Pressure, Young's modulus, stress

B. Emf, potential difference, electric potential

C. Heat, work done, energy

D. Dipole moment, electric flux, electric field.

Answer: D

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Dimensional Formulae And Dimensional Equations

1. Match the column I with column II

Column I (Physical quantity)		Column II (Dimensional formula)	
(A)	Permittivity of free space	(p)	$[M^0L^0T^{-1}]$
(B)	Radiant flux	(q)	$[ML^3T^{-3}A^{-2}]$
(C)	Resistivity	(r)	$[ML^2T^{-3}]$
(D)	Hubble constant	(s)	$[M^{-1}L^{-3}T^4A^2]$

A. A-p,B-q,C-r,D-s

B. A-q,B-p,C-s,D-r

C. A-s,B-r,C-q,D-p

D. A-r,B-s,C-p,D-q

Answer: C

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

A. mass

B. length

C. time

D. angle

Answer: D

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3. If power (P), surface tension (S) and Planck's constant (h) are arranged so that the dimensions of time in their dimensional formulae are in ascending order, then which of the following is correct?

A. P,S,h

B. P,h,S

C. S,P,h

D. S,h,P

Answer: A

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4. The dimension of Planck's constant are the same as that of

A. charge

B. work

C. force

D. Angular momentum

Answer: D

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5. Match the column I with column II

Column I (Units)		Column II (Dimensional formulae)	
(A)	Pa s	(p)	$[M^0L^2T^{-2}K^{-1}]$
(B)	$N\ m\ K^{-1}$	(q)	$[MLT^{-3}K^{-1}]$
(C)	$J\ kg^{-1}\ K^{-1}$	(r)	$[ML^{-1}T^{-1}]$
(D)	$W\ m^{-1}\ K^{-1}$	(s)	$[ML^2T^{-2}K^{-1}]$

A. A-q,B-p,C-r,D-s

B. A-p,B-q,C_s,D-r

C. A-r,B-s,C-p,D-q

D. A-s,B-r,C-q,D-p

Answer: C

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6. The dimensional formula of electric potential is

A. $\left[ML^2T^{-3}A^1\right]$

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

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

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

Answer: A

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7. Dimensional formula of ΔQ, heat supplied to the system is:

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

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

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

D. $[MLT^1]$

Answer: A

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8. The dimensional formula of physical quantity is $[M^aL^bT^c]$.Then that physical quantity is

A. surface tension if a=1,b=1,c=-2

B. force if a=1,b=1,c=2

C. angular frequency if a=0,b=0,c=-1

D. spring constant if a=1,b=-1,c=-2

Answer: C

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Dimensional Analysis And Its Applications

1. Checking the correctness of equations using the method of dimensions is based on

A. the type of system

B. equality of inertial frames of references

C. principle of homogeneity of dimensions

D. none of these

Answer: C

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2. Using the principle of homogeneity of dimensions, which of the following is correct?

A. $T^2 = \frac{4\pi^2 r^3}{GM}$

B. $T^2 = 4\pi^2 r^2$

C. $T^2 = \frac{4\pi^2 r^3}{G}$

D. $T = \frac{4\pi^2 r^3}{G}$

Answer: A

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3. Which of the following relations is dimensionally incorrect?

A. $1u = 931.5$ MeV

B. 1u=931.5 MeV $/ c^2$

C. 1u=1.67 $\times 10^{-27} kg$

D. none of these

Answer: B

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4. On the basis of dimensions, decide which of the following relation for the displacement of a particle undergoing simple harmonic motion is not correct :

A. $y = a\sin\left(\frac{2\pi t}{T}\right)$

B. $y = a\cos\omega t$

C. $y = \frac{a}{T}\sin\left(\frac{t}{a}\right)$

D. $y = a\sqrt{2}\left(\sin\left(\frac{2\pi t}{T}\right) + \cos\left(\frac{2\pi t}{T}\right)\right)$

Answer: C

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5. The displacement of a progressive wave is represented by $y = A\sin(\omega t - kx)$ where x is distance and t is time. The dimensions of $\frac{\omega}{k}$ are same as those of

A. velocity

B. wave number

C. wavelength

D. frequency

Answer: A

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6. If velocity of light c, planck's constant h and gravitational constnat G are taken as fundamental quantities then the dimensions of the length will be

A. $\sqrt{\frac{ch}{G}}$

B. $\sqrt{\frac{hG}{c^5}}$

C. $\sqrt{\frac{hG}{c^3}}$

D. $\sqrt{\frac{hc^3}{G}}$

Answer: C

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7. A new system of units is proposed in which unit of mass is αkg, unit of length β m and unit of time γs. How much will 5 J measure in this new system ?

A. $5\alpha\beta^2\gamma^{-2}$

B. $5\alpha^{-1}\beta^{-2}\gamma^2$

C. $5\alpha^{-2}\beta^{-1}\gamma^{-2}$

D. $5\alpha^{-1}\beta^2\gamma^2$

Answer: B

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8. If the energy, $E = G^p h^q c^r$, where G is the universal gravitational constant, h is the Planck's constant and c is the velocity of light, then the values of p are q and r are, respectively

A. $-1/2, 1/2$ and $5/2$

B. $1/2, -1/2$ and $-5/2$

C. $-1/2, 1/2$ and $3/2$

D. $1/2, -1/2$ and $-3/2$

Answer: A

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9. The equation fo state of a gas is given by $\left(P+\frac{a}{V^3}\right)\left(V-b^2\right)=cT$, where P,V,T are pressure, volume and temperature respectively, and a,b,c are constants. The dimesions of a and b are respectively

A. $\left[ML^8T^{-2}\right]$ and $\left[L^{3/2}\right]$

B. $\left[ML^5T^{-2}\right]$ and $\left[L^3\right]$

C. $\left[ML^{5}T^{-2}\right]$ and $\left[L^{6}\right]$

D. $\left[ML^{6}T^{-2}\right]$ and $\left[L^{3/2}\right]$

Answer: A

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10. The velocity of a paritcle (v) at an instant t is given by $v = at + bt^{2}$. The dimesion of b is

A. [L]

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

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

D. $\left[LT^{-3}\right]$

Answer: D

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Ncert Exemplar

1. The number of significant figures in 0.06900 is

A. 5

B. 4

C. 2

D. 3

Answer: B

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2. The sum of the numbers 436.32, 227.2 and 0.301 in appropriate significant figures is

A. 663.821

B. 664

C. 663.8

D. 663.82

Answer: C

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3. The mass and volume of a body are 4.237 g and $2.5cm^3$, respectively. The density of the meterial of the body in correct significant figures is

A. $1.6948 gcm^{-3}$

B. $1.69 gcm^{-3}$

C. $1.7 gcm^{-3}$

D. $1.695 gcm^{-3}$

Answer: C

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4. The numbers 2.745 and 2.735 on rounding off to 3 significant figures will give

A. 2.75 and 2.74

B. 2.74 and 2.73

C. 2.75 and 2.73

D. 2.74 and 2.74

Answer: D

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5. The length and breadth of a rectangular sheet are 16.2 cm and 10.1cm, respectively. The area of the sheet in appropriate significant figures and error is

A. $164 \pm 3cm^2$

B. $163.62 \pm 2.6cm^2$

C. $163.6 \pm 2.6cm^2$

D. $163.62 \pm 3cm^2$

Answer: A

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6. Which of the following pairs of physical quantites does not have same dimensional formula ?

A. Work and torque

B. Angular momentum and Planck's constant.

C. Tension and surface tension.

D. Impulse and linear momentum.

Answer: C

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7. Measure of two quantities along with the precision of respective measuring instrument is $A = 2.5ms^{-1} \pm 0.5ms^{-1}$,B=0.10s+-0.01s`. The value of AB will be

A. $(0.25 \pm 0.08)m$

B. $(0.25 \pm 0.5)m$

C. $(0.25 \pm 0.05)m$

D. $(0.25 \pm 0.135)m$

Answer: A

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8. You measure two quantities as $A = 1.0m \pm 0.2m, B = 2.0m \pm 0.2m$. We should report correct value for $\sqrt{AB}$ as

A. $1.4m \pm 0.4m$

B. $1.41m \pm 0.15m$

C. $1.4m \pm 0.3m$

D. $1.4m \pm 0.2m$

Answer: D

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9. which of the following measurements is most precise ?

A. 5.00 mm

B. 5.00 cm

C. 5.00 m

D. 5.00 kg

Answer: A

View Text Solution

10. The mean length of an object is 5 cm. Which of the following measurements is most accurate?

A. 4.9 cm

B. 4.805 cm

C. 5.25 cm

D. 5.4 cm

Answer: A

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11. Young's modulus of steel is $1.9 \times 10^{11} N / m^2$ When expressed is CGS units of $dynes / cm^2$ it will be equal to $(1N = 10^5 dyne, 1m^2 = 10^4 cm^2)$

A. 1.9×10^{10}

B. 1.9×10^{11}

C. 1.9×10^{12}

D. 1.9×10^{13}

Answer: C

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12. If momentum (p), area (A) and time$(t)$are taken to be fundamental quantities then energy has the dimensional formula

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

B. $\left[p^2 A^1 t^1\right]$

C. $\left[p^1 A^{1/2} t^1\right]$

D. $\left[p^1 A^{1/2} t^{-1}\right]$

Answer: D

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Assertion And Reason

1. Assertion: The units of some physical quantities can be expressed as combination of the base units. ltbr. Reason: We need only a limited number of units for expressing the derived physical quantities.

A. if both assertion and reason are true reason is the correct explanation of assertion.

B. If both assertion and reason are true but reason is not the correct explanation fo assertion.

C. If assertion is true but reaso is false.

D. IF both assertion and reason are false.

Answer: A

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2. 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 reason is the correct explanation of

assertion.

B. If both assertion and reason are true but reason is not the correct explanation fo assertion.

C. If assertion is true but reaso is false.

D. IF both assertion and reason are false.

Answer: C

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3. 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 reason is the correct explanation of assertion.

B. If both assertion and reason are true but reason is not the correct explanation fo

assertion.

C. If assertion is true but reaso is false.

D. IF both assertion and reason are false.

Answer: A

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4. Assertion: Light year is the distance that light travels with velocity of $3 \times 10^8 ms^{-1}$ in one year.

Reason: Light year is the unit for measuring time.

A. if both assertion and reason are true reason is the correct explanation of assertion.

B. If both assertion and reason are true but reason is not the correct explanation fo assertion.

C. If assertion is true but reaso is false.

D. IF both assertion and reason are false.

Answer: C

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5. Assertion: When percentage error in the meansurement of mass and velocity are 1% and 2% respectively the percentagwe error in K.E. is 5%.

Reason: $\frac{\Delta K}{K} = \frac{\Delta m}{m} = \frac{2\Delta v}{v}$.

A. if both assertion and reason are true reason is the correct explanation of

assertion.

B. If both assertion and reason are true but reason is not the correct explanation fo assertion.

C. If assertion is true but reaso is false.

D. IF both assertion and reason are false.

Answer: A

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6. Assertion: The number 1.202has four significant figure and the number 0.0024 has two significant figure.

Reason: All the zero digits are significant.

A. if both assertion and reason are true reason is the correct explanation of assertion.

B. If both assertion and reason are true but reason is not the correct explanation fo assertion.

C. If assertion is true but reaso is false.

D. IF both assertion and reason are false.

Answer: B

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7. Assertion: A number 2.746 rounded off to three significant figures is 2.75, while the number 2.743 would be 2.74.

Reason: In rounding off the uncertain digits, the preceding digit is raised by 1 if the insignificant digit to be dropped is more than 5 and is left unchanged if the latter is less than 5.

A. if both assertion and reason are true reason is the correct explanation of assertion.

B. If both assertion and reason are true but reason is not the correct explanation fo assertion.

C. If assertion is true but reaso is false.

D. IF both assertion and reason are false.

Answer: A

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8. Assertion: The given equation $x = x_0 + u_0 t + \frac{1}{2} a t^2$ is dimensionally correct, where x is the distance travelled by a particle in time t , initial position x_0 initial velocity u_0 and uniform acceleration a is along the direction of motion.

Reason: Dimensional analysis can be used for cheking the dimensional consistency or homogenetly of the equation.

A. if both assertion and reason are true reason is the correct explanation of assertion.

B. If both assertion and reason are true but reason is not the correct explanation fo assertion.

C. If assertion is true but reaso is false.

D. IF both assertion and reason are false.

Answer: A

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9. Assertion: A dimensionally wrong or inconsistaent equation must be wrong.

Reason: A dimensionally consistent equation is a exact or a correct equation.

A. if both assertion and reason are true reason is the correct explanation of assertion.

B. If both assertion and reason are true but reason is not the correct explanation fo assertion.

C. If assertion is true but reaso is false.

D. IF both assertion and reason are false.

Answer: C

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10. Assertion: Force can be added to pressure.

Reason: Force and pressure have same dimensions.

A. if both assertion and reason are true reason is the correct explanation of assertion.

B. If both assertion and reason are true but reason is not the correct explanation fo assertion.

C. If assertion is true but reaso is false.

D. IF both assertion and reason are false.

Answer: D

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

Reason : Both have dimensions of time.

A. if both assertion and reason are true reason is the correct explanation of assertion.

B. If both assertion and reason are true but reason is not the correct explanation fo assertion.

C. If assertion is true but reaso is false.

D. IF both assertion and reason are false.

Answer: C

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12. Assertion: Pressure can not be subtracted from pressure gradient.

Reason: Pressure and pressure gradient have different dimensions.

A. if both assertion and reason are true reason is the correct explanation of assertion.

B. If both assertion and reason are true but reason is not the correct explanation fo

assertion.

C. If assertion is true but reaso is false.

D. IF both assertion and reason are false.

Answer: A

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13. Assertion: Both velocity and pseed have same dimesions.

Reason: Velocity cannot be added to speed.

A. if both assertion and reason are true reason is the correct explanation of assertion.

B. If both assertion and reason are true but reason is not the correct explanation fo assertion.

C. If assertion is true but reaso is false.

D. IF both assertion and reason are false.

Answer: B

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14. Assertion: The dimensional formula of surface energy is $[M^1L^2T^{-2}]$. Reason: Surface energy has same dimensions as that of potential energy.

A. if both assertion and reason are true reason is the correct explanation of assertion.

B. If both assertion and reason are true but reason is not the correct explanation fo

assertion.

C. If assertion is true but reaso is false.

D. IF both assertion and reason are false.

Answer: B

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15. Assertion: Angle and angular displacement a dimensionless quantities.

Reason: Angle is equal in arc length divided by radius.

A. if both assertion and reason are true reason is the correct explanation of assertion.

B. If both assertion and reason are true but reason is not the correct explanation fo assertion.

C. If assertion is true but reaso is false.

D. IF both assertion and reason are false.

Answer: A

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