Units and Measurement JEE Main PYQ - 3

Total Time: 1 Hour **Total Marks:** 100

Instructions

Instructions

1. Test will auto submit when the Time is up.
2. The Test comprises of multiple choice questions (MCQ) with one or more correct answers.
3. The clock in the top right corner will display the remaining time available for you to complete the examination.

Navigating & Answering a Question

1. The answer will be saved automatically upon clicking on an option amongst the given choices of answer.
2. To deselect your chosen answer, click on the clear response button.
3. The marking scheme will be displayed for each question on the top right corner of the test window.

Units and Measurement

1. The SI unit of a physical quantity is pascal-second. The dimensional formula of this quantity will be **(+4, -1)**

a. $[ML^{-1}T^{-1}]$

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

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

d. $[M^{-1}L^{3}T^{0}]$

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2. The vernier constant of Vernier callipers is 0.1 mm and it has zero error of (−0.05) cm. While measuring diameter of a sphere, the main scale reading is 1.7 cm and coinciding vernier division is 5. The corrected diameter will be _____× 10^{-2} cm. **(+4, -1)**

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3. Consider the efficiency of Carnot's engine is given by $\eta = \frac{\alpha\beta}{sin\theta} log_e \frac{\beta x}{kT}$, where α and β are constants. If T is temperature, k is Boltzman constant, θ is angular displacement and x has the dimensions of length. Then, choose the incorrect option. **(+4, -1)**

a. Dimensions of β is same as that of force.

b. Dimension of $\alpha^{-1}x$ is same as that of energy.

c. Dimension of $\eta^{-1}sin\theta$ is same as that of $\alpha\beta$.

d. Dimensions of α is same as that of β

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4. The variation of applied potential and current flowing through a given wire is shown in figure. The length of wire is 31.4 cm. The diameter of wire is measured as 2.4 cm. The resistivity of the given wire is measured as $x \times 10^{-3}\Omega$ cm. The value of x is____. [Take π = 3.14] **(+4, -1)**

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5. A body is performing simple harmonic with an amplitude of 10 cm. The velocity of the body was tripled by air jet when it is at 5 cm from its mean position. The new amplitude of vibration is $\sqrt{x}$ cm. The value of x is ___. **(+4, -1)**

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6. Two coils require 20 minutes and 60 minutes respectively to produce same amount of heat energy when connected separately to the same source. If they are connected in parallel arrangement to the same source; the time required to produce same amount of heat by the combination of coils, will be ___ min. **(+4, -1)**

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7. identical drops are charged at 22 V each. They combine to form a bigger drop. The potential of the bigger drop will be _____ V. **(+4, -1)**

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8. A travelling microscope is used to determine the refractive index of a glass slab. If 40 divisions are there in 1 cm on main scale and 50 Vernier scale divisions are equal to 49 main scale divisions, then least count of the travelling microscope is _____× 10^{-6} m. **(+4, -1)**

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9. For **(+4, -1)**

$z = a^2x^3y^{\frac{1}{2}}$

where 'a' is a constant. If percentage error in measurement of 'x' and 'y' are 4% and 12%, respectively, then the percentage error for 'z' will be ____ %.

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10. In an experiment of determine the Young's modulus of wire of a length exactly 1 m, the extension in the length of the wire is measured as 0.4 mm with an uncertainty of ±0.02 mm when a load of 1 kg is applied. The diameter of the wire is measured as 0.4 mm with an uncertainty of ±0.02 mm when a load of 1 kg is applied. The diameter of the wire is measured as 0.4 mm with an uncertainty of ± 0.01 mm. The error in the measurement of Young's modulus (ΔY) is found to be x × 10^{10} Nm^{-2}. The value of x is ___.
(Take g=10 m/s^2) **(+4, -1)**

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11. Given below are two statements : One is labelled as Assertion A and the other is labelled as Reason R. **(+4, -1)**

Assertion A : Product of Pressure (P) and time (t) has the same dimension as that of coefficient of viscosity.
Reason R : Coefficient of viscosity
$= \frac{Force}{Velocity \sim gradient}$

Choose the correct answer from the options given below.

a. Both A and R true, and R is correct explanation of A.

b. Both A and R are true but R is NOT the correct explanation of A.

c. A is true but R is false.

d. A is false but R is true.

---

12. A screw gauge of pitch 0.5 mm is used to measure the diameter of uniform wire of length 6.8 cm, the main scale reading is 1.5 mm and circular scale reading is 7. The calculated curved surface area of wire to appropriate significant figures is : [Screw gauge has 50 divisions on its circular scale.] **(+4, -1)**

a. $6.8\ cm^2$

b. $3.4\ cm^2$

c. $3.9\ cm^2$

d. $2.4\ cm^2$

---

13. In a Vernier Calipers, 10 divisions of Vernier scale is equal to the 9 divisions of main scale. When both jaws of Vernier calipers touch each other, the zero of the Vernier scale is shifted to the left of zero of the main scale and 4th Vernier scale division exactly coincides with the main scale reading. One main scale division is equal to 1 mm. While measuring diameter of a spherical body, the body is held between two jaws. It is now observed that zero of the Vernier scale lies between 30 and 31 divisions of main scale reading and 6th Vernier scale division exactly coincides with the main scale reading. The diameter of the spherical body will be **(+4, -1)**

a. 3.02 cm

b. 3.06 cm

c. 3.10 cm

d. 3.20 cm

14. A unit scale is to be prepared whose length does not change with temperature and remains 20 cm, using a bimetallic strip made of brass and iron each of different length. The length of both components would change in such a way that difference between their lengths remains constant. If length of brass is 40 cm and length of iron will be ___ cm. **(+4, -1)**

15. Which of the following physical quantities have the same dimensions? **(+4, -1)**

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

b. Displacement current and electric field

c. Current density and surface charge density

d. Electric potential and energy

16. A silver wire has a mass $(0.6 \overset{+}{-} 0.006)$ g, radius $(0.5 \overset{+}{-} 0.005)$ mm and length $(4 \overset{+}{-} 0.04)$ cm. The maximum percentage error in the measurement of its density will be **(+4, -1)**

a. 4%

b. 3%

c. 6%

d. 7%

17. If $Z = \frac{A^2B^3}{C^4}$, then the relative error in Z will be **(+4, -1)**

a. $\frac{\triangle A}{A} + \frac{\triangle B}{B} + \frac{\triangle C}{C}$

b. $\frac{2\triangle A}{A} + \frac{3\triangle B}{B} - \frac{4\triangle C}{C}$

c. $\frac{2\triangle A}{A} + \frac{3\triangle B}{B} + \frac{4\triangle C}{C}$

d. $\frac{\triangle A}{A} + \frac{\triangle B}{B} - \frac{\triangle C}{C}$

18. A water drop of radius $1\,cm$ is broken into 729 equal droplets If surface tension of water is $75\,dync/cm$, then the gain in surface energy upto first decimal place will be : [Given $\pi = 314$] **(+4, -1)**

a. $8.5 \times 10^{-4} J$

b. $8.2 \times 10^{-4} J$

c. $7.5 \times 10^{-4} J$

d. $5.3 \times 10^{-4} J$

---

19. A screw gauge of pitch $05\,mm$ is used to measure the diameter of uniform wire of length $68\,cm$, the main scale reading is $15\,mm$ and circular scale reading is 7. The calculated curved surface area of wire to appropriate significant figures is :[Screw gauge has 50 divisions on the circular scale] **(+4, -1)**

a. $6.8\,cm^2$

b. $3.4\,cm^2$

c. $3.9\,cm^2$

d. $2.4\,cm^2$

---

20. Which of the following physical quantities have the same dimensions? **(+4, -1)**

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

b. Displacement current and electric field

c. Current density and surface charge density

d. Electric potential and energy

---

21. If momentum $[P]$, area $[A]$ and time $[T]$ are taken as fundamental quantities, then the dimensional formula for coefficient of viscosity is : **(+4, -1)**

a. $\left[PA^{-1}T^{0}\right]$

b. $[PAT^{-1}]$

c. $[PA^{-1}T]$

d. $[PA^{-1}T^{-1}]$

---

22. Match column I with column II and choose the correct option. **(+4, -1)**

Column I	Column II
(I) Torque	(a) M^0LT^{-2}
(II) stress	(b) $ML^{-1}T^{-1}$
(III) Coefficient of viscosity	(c) $ML^{-1}T^{-2}$
(IV) Potential gradient	(d) ML^27^{-2}

a. I → a, II → c, III → b, IV → d

b. I → d, II → b, III → c, IV → a

c. I → d, II → c, III → b, IV → a

d. I → a, II → c, III → d, IV → b

---

23. Density (p) of a body depends on the force applied (F), its speed (v) and time of motion (t) by the relation $p = KF^av^bt^c$, where K is a dimensionless constant. Then **(+4, -1)**

a. a=1, b=-4 and c=-2

b. a=2, b=-4 and c=-1

c. a=-1, b=-4 and c=2

d. a=1, b=4 and c=-2

---

24. If mass, radius of cross-section and height of a cylinder are (0.4+0.01) g, (6+0.03) m and height (8+0.04) m. The maximum percentage error in the measurement of density of cylinder is? **(+4, -1)**

a. 1%

b. 4%

c. 8%

d. 7%

---

25. $R_1 = (15 \pm 0.5)\ \Omega$ **(+4, -1)**

$R_2 = (10 \pm 0.5)\ \Omega$

Find % error in equivalent resistance if resistors R_1 and R_2 are connected in parallel ?

a. 5%

b. 4.33%

c. 3%

d. 3.33%

Answers

1. **Answer: a**

Explanation:

$= \frac{MLT^{-2}}{L^2} \times T$ [pascal-second]

$= ML^{-1}T^{-1}$

Concepts:

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2. **Answer: 180 - 180**

Explanation:

The correct answer is 180
As the zero error is negative, we will add 0.05 cm to the reading
⇒ Corrected reading = 1.7 cm + 5 × 0.1 mm + 0.05 cm
= 180×10^{-2} cm

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3. **Answer: d**

Explanation:

Here , βx will be having the units of energy.
So β will have same dimensions of force.
$\alpha\beta = \eta = sin\theta$ =Dimentionless $\eta^{-1} sin\theta = \alpha\beta$ =D.L.
So α^{-1} will have the dimensions of force.
So $\alpha^{-1}x$ will have the dimensions of energy.

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4. Answer: 144 - 144

Explanation:

The correct answer is: 144

Resistance = tan 45° = 1 Ω

$\Rightarrow 1 = \frac{pl}{A}$

$\Rightarrow p = \frac{\pi(1.2\ cm)^2}{31.4\ cm} = 1.44 \times 10^{-1}\ \Omega\, cm$

$\Rightarrow x = 144$

Concepts:

1. Current Electricity:

Current electricity is defined as the flow of electrons from one section of the circuit to another.

Types of Current Electricity

There are two types of current electricity as follows:

Direct Current

The current electricity whose direction remains the same is known as direct current. Direct current is defined by the constant flow of electrons from a region of high electron density to a region of low electron density. DC is used in many household appliances and applications that involve a battery.

Alternating Current

The current electricity that is bidirectional and keeps changing the direction of the charge flow is known as alternating current. The bi-directionality is caused by a sinusoidally varying current and voltage that reverses directions, creating a periodic back-and-forth motion for the current. The electrical outlets at our homes and industries are supplied with **alternating current**.

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5. Answer: 700 - 700

Explanation:

The correct option is: 700

$v = \omega\sqrt{A^2 - y^2}$

$\Rightarrow 9 \times 75 = (A')^2 - 25$

$\Rightarrow A' = \sqrt{28 \times 25}\, cm$

$\Rightarrow x = 700$

Concepts:

1. Energy In Simple Harmonic Motion:

We can note there involves a continuous interchange of potential and kinetic energy in a simple harmonic motion. The system that performs simple harmonic motion is called the harmonic oscillator.

Case 1: When the potential energy is zero, and the kinetic energy is a maximum at the equilibrium point where maximum displacement takes place.

Case 2: When the potential energy is maximum, and the kinetic energy is zero, at a maximum displacement point from the equilibrium point.

Case 3: The motion of the oscillating body has different values of potential and kinetic energy at other points.

---

6. Answer: 15 - 15

Explanation:

The correct answer is: 15.

$H = \frac{v^2}{R}.\triangle t$

$\Rightarrow H = \frac{v^2}{R_1}.20 = \frac{v^2}{R_2}.60....(i)$

Also,

$\frac{4}{3}.\frac{V^2}{R_1}.\triangle t$

$[\because R_2 = 3R_1]$

$\Rightarrow \Delta t = 15$

Concepts:

1. Types of Differential Equations:

There are various types of Differential Equation, such as:

Ordinary Differential Equations:

Ordinary Differential Equations is an equation that indicates the relation of having one independent variable x, and one dependent variable y, along with some of its other derivatives.

$$F(\frac{dy}{dt}, y, t) = 0$$

Partial Differential Equations:

A partial differential equation is a type, in which the equation carries many unknown variables with their partial derivatives.

1. $\frac{\partial^2 u}{\partial x^2} + \frac{\partial^2 u}{\partial y^2} = 0$
2. $u_{xx} + u_{yy} = 0$
3. $ux\frac{\partial^2 u}{\partial x^2} + u^2xy\frac{\partial^2 u}{\partial x \partial y} + uy\frac{\partial^2 u}{\partial y^2} + \left(\frac{\partial u}{\partial x}\right)^2 + \left(\frac{\partial u}{\partial y}\right)^2 + u^3 = 0$
4. $\frac{\partial^2 u}{\partial x^2} + (\frac{\partial^2 u}{\partial x \partial y})^2 + \frac{\partial^2 u}{\partial y^2} = x^2 + y^2$

Linear Differential Equations:

It is the linear polynomial equation in which derivatives of different variables exist. Linear Partial Differential Equation derivatives are partial and function is dependent on the variable.

Linear Differential Equation in y

$$\frac{dy}{dx} + Py = Q$$

Linear Differential Equation in x

$$\frac{dx}{dy} + P_1x = Q_1$$

Homogeneous Differential Equations:

When the degree of f(x,y) and g(x,y) is the same, it is known to be a homogeneous differential equation.

$$\frac{dy}{dx} = \frac{a_1x+b_1y+c_1}{a_2x+b_2y+c_2}$$

Read More: Differential Equations

7. **Answer: 198 - 198**

Explanation:

Let the charge on one drop is *q* and its radius is *r*.

So for one drop

$V = \frac{Kq}{r}$

For 27 drops merged new charge will be $Q = 27q$

and new radius is $R = 3r$

So new potential is

$V' = \frac{kq}{R} = 9\frac{kq}{r} = 9 \times 22\ V$

= 198 V

Concepts:

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8. **Answer: 5 - 5**

Explanation:

The correct answer is 5×10^{-6} m
Given : 40 M = 1 cm
$\Rightarrow$ M = 0.025 cm .....(1)
And also, 50 V = 49 M
$\Rightarrow$ Least count = M − V
$= M - \frac{49}{50}M$
$= \frac{M}{50}$
$\Rightarrow LC = \frac{0.025}{50}cm$
$= \frac{250}{50} \times 10^{-6}m$
$\Rightarrow$ LC = 5×10^{-6} m

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9. **Answer: 18 - 18**

Explanation:

% error in z =

$3\times4+\frac{1}{2}\times12$

= 12 + 6 = 18%

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10. **Answer: 2 - 2**

Explanation:

We know that,

$Y = \frac{F/A}{l/L}$

$A = \pi D^2$

$\frac{\Delta Y}{Y} = \frac{\Delta F}{F} + 2\frac{\Delta D}{D} + \Delta\frac{l}{e} + \frac{\Delta L}{L}$

$= 2 \times \frac{0.01}{0.4} + \frac{0.02}{0.4}$

$= \frac{0.04}{0.4}$

$= \frac{1}{10}$

Now,

$Y = \frac{Fl}{A\Delta l}$

$Y = \frac{10 \times 1}{\pi(0.1\ mm)^2 \times 0.4\ mm}$

$= 1.988 \times 10^{11}$

$\approx 2 \times 10^{11}$

$\frac{\Delta y}{y} = \frac{1}{10}$

$\Delta y = \frac{y}{10}$

$\Delta y = 2 \times 10^{10}$

So, the answer is 2.

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11. Answer: c

Explanation:

The correct answer is (C) : A is true but R is false.

$[Pressure][Time] = [\frac{Force}{Area}][\frac{Distance}{Velocity}]$

$[Coefficient \sim of \sim viscosity] = [\frac{Force}{Area}][\frac{Distance}{Velocity}]$

Statement 'A' is true

But statement R is false are coefficient of viscosity

$= \frac{Force}{Area \times Velocitygradient}$

Concepts:

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12. Answer: b

Explanation:

Least count = $\frac{0.5}{50}\ mm$ = $0.01\ mm$
Diameter, $d = 1.5\ mm + 7 \times 0.01 = 1.57\ mm$
Surface area = $(2\pi r) \times l$
= πdl
= $3.142 \times \frac{1.57}{10} \times 6.8\ cm^2$
= $3.354\ cm^2$
= $3.4\ cm^2$

So, the correct option is (B): $3.4\ cm^2$

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13. **Answer: c**

Explanation:

The diameter of the spherical body:

$LC = \frac{1}{10}\ MSD \quad AS \qquad [10VSD = 9MSD]$

$= 0.01\ cm$

$(0.1–0.04)\ cm = 0.06\ cm\ [Negative\ Error]$

$(3.0\ cm) + 6(0.01)\ cm + 0.06\ cm\ [Reading]$

$= 3.12\ cm$

Which is approximately Closer to $3.10\ cm$

Hence, the correct option is (C): $3.10\ cm$

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14. Answer: 60 - 60

Explanation:

$l_{B_1}+\alpha_B\Delta T-l_{i_1}+\alpha_i\Delta T=l_B-l_i$

$\alpha_B l_B=l_i\alpha_i$ $1.8\times10^{-5}\times40=l_i\times1.2\times10^{-5}$

$l_i=\frac{1.8\times10^{-5}\times40}{1.2\times10^{-5}}=\frac{3\times40}{2}=60$

$l_i=60cm$

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15. Answer: a

Explanation:

Electric displacement $\vec{D} = \epsilon_0 \vec{E}$
$[\vec{D}] = [\epsilon_0][\vec{E}]$
$[M^{-1}L^{-3}T^4A^2][M^1L^1A^{-1}T^{-3}]$
$[\vec{D}] = [L^{-2}T^1A^1]$
[D]=[σ]
Surface change density = $|\frac{Q}{A}|$
$[\sigma] = [ATL^{-2}]$
So, Electric displacement and Surface charge density have the same units.

Therefore the correct option is (A): Electric displacement ($\vec{D}$) and surface charge density.

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---

16. **Answer: a**

Explanation:

$\rho = \frac{m}{v} = \frac{m}{\pi r^2 \times l}$

$\therefore$ Percentage error in

$\rho = \left(\frac{0.006}{0.6} + 2 \times \frac{0.005}{0.5} + \frac{0.04}{4} \right) \times 100$

$= 4\%$

Concepts:

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17. **Answer: c**

Explanation:

$Z = \frac{A^2B^3}{C^4}$

$\therefore \frac{\triangle Z}{Z} = \frac{2\triangle A}{A} + \frac{3\triangle B}{B} + \frac{4\triangle C}{C}$

So, the correct option is (C): $\frac{2\triangle A}{A} + \frac{3\triangle B}{B} + \frac{4\triangle C}{C}$

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18. **Answer: c**

Explanation:

The correct option is(C): $7.5 \times 10^{-4} J$.

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19. Answer: b

Explanation:

The correct option is (B): $3.4\,cm^2$

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20. **Answer: a**

Explanation:

Electric displacement $\vec{D} = \epsilon_0 \vec{E}$
$[\vec{D}] = [\epsilon_0][\vec{E}]$
$[M^{-1}L^{-3}T^4A^2][M^1L^1A^{-1}T^{-3}]$
$[\vec{D}] = [L^{-2}T^1A^1]$
[D]=[σ]
Surface change density = $|\frac{Q}{A}|$
$[\sigma] = [ATL^{-2}]$
So, Electric displacement and Surface charge density have the same units.

Therefore the correct option is (A): Electric displacement ($\vec{D}$) and surface charge density.

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21. **Answer: a**

Explanation:

The correct answer is option (A)

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22. Answer: c

Explanation:

(A) **Torque:** Torque (T) is given by the product of force (F) and distance (L):

$$[\text{Torque}] = F \cdot L.$$

The dimensional formula for force is:

$$[F] = MLT^{-2}.$$

Thus, the dimensional formula for torque is:

$$[\text{Torque}] = MLT^{-2} \cdot L = ML^2T^{-2}.$$

So, $A \to I$. (B) **Stress:** Stress (σ) is defined as force (F) per unit area (A):

$$[\text{Stress}] = \frac{F}{A}.$$

The dimensional formula for area is:

$$[A] = L^2.$$

Therefore:

$$[\text{Stress}] = \frac{MLT^{-2}}{L^2} = ML^{-1}T^{-2}.$$

So, $B \to IV$. (C) **Pressure Gradient:** Pressure gradient is defined as the change in pressure per unit length ($\Delta P/\Delta L$):

$$\left[\frac{\Delta P}{\Delta L}\right] = \frac{F/A}{L}.$$

Substituting the dimensional formula for pressure (F/A):

$$[\text{Pressure Gradient}] = \frac{ML^{-1}T^{-2}}{L} = ML^{-2}T^{-2}.$$

So, $C \to I$. (D) **Coefficient of Viscosity:** The coefficient of viscosity (η) is defined as:

$$[\eta] = \frac{\text{Force per unit area}}{\text{Velocity gradient}}.$$

The dimensional formula for velocity gradient is:

$$\left[\frac{v}{L}\right] = T^{-1}.$$

Therefore:

$$[\eta] = \frac{ML^{-1}T^{-2}}{T^{-1}} = ML^{-1}T^{-1}.$$

So, $D \to III$. **Final Answer:** The correct match is:

$$\boxed{\text{A-II, B-IV, C-I, D-III}}.$$

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23. Answer: a

Explanation:

The density of a body can be expressed as:
$p = KF^a * v^b * t^c$
where K is a dimensionless constant and a, b, and c are constants.
We can determine the values of a, b, and c by considering the units of the given parameters. The SI units of force, speed, and time are newtons (N), meters per second ($\frac{m}{s}$), and seconds (s), respectively. The SI unit of density is kilograms per cubic meter ($\frac{Kg}{m^3}$).
From the given relation, we can express K in terms of the units of the parameters:
$p = KF^a * v^b * t^c$
$K = \frac{p}{(F^a * v^b * t^c)}$
Substituting the units of the parameters, we get:
$K = \frac{(\frac{kg}{m^3})}{(N^a * (\frac{m}{s})^b * s^c)}$
We can simplify this expression by rearranging the units using the rules of exponents:
$K = (\frac{kg}{N^a * m^b * s^c})^{\frac{1}{m}}$
Comparing the units of the expression inside the parentheses with the units of the given parameters, we can determine the values of a, b, and c:
a = 1 (force has units of N)
b = -4 (speed has units of $\frac{m}{s}$, which cancels out the length unit of meters in the numerator of K)
c = -2 (time has units of s^1, which cancels out the s^c term in the denominator of K)
Therefore, the correct answer is a = 1, b = -4, and c = -2. (Option A).
Answer. A

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24. Answer: b

Explanation:

Step 1: Use the formula for density and apply error propagation principles.- Given m = (0.4±0.01)g, l = (8±0.04)cm, r = (6±0.03)mm.- Density ρ = $\frac{m}{\pi r^2 \ell}$.- Differentiate logarithmically:- Substitute:

$$\frac{\Delta\rho}{\rho} = \frac{\Delta m}{m} + \frac{\Delta \ell}{\ell} + 2\frac{\Delta r}{r} .$$

$$\frac{\Delta\rho}{\rho} = \frac{0.01}{0.4} + \frac{0.04}{8} + 2\frac{0.03}{6} .$$

Step 2: Simplify the calculations.

$$\frac{\Delta\rho}{\rho} = 0.025 + 0.005 + 0.01 = 0.04.$$

Final Answer: Maximum error in density = 0.04 × 100 = 4%.

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25. **Answer: b**

Explanation:

$\frac{1}{R_{eq}} = \frac{1}{R_1} + \frac{1}{R_2}$ and $R_{eq} = \frac{150}{25} = 6\Omega$

$\frac{dR_{eq}}{R_{eq}^2} = \frac{dR_1}{R_1^2} + \frac{dR_2}{R_2^2}$

$\frac{dR_{eq}}{R_{eq}} = R_{eq}[\frac{dR_1}{R_1^2} + \frac{dR_2}{R_2^2}]$

$\frac{dR_{eq}}{R_{eq}} = 6[\frac{0.5}{15^2} + \frac{0.5}{10^2}]$

Therefore, % $\frac{dR_{eq}}{R_{eq}} = 6 \times 0.5 \times 100[\frac{1}{225} + \frac{1}{100}] = 6 \times 0.5 \times 100 \times \frac{325}{225 \times 100} = 4.33\%$

So, the answer is (B): 4.33%

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