Question

Which of the following is not a physical quantity?

A Mass

B Displacement

C Happiness

D Time

Question

Which of the following is a physical quantity?

A Grief

B Distance

C Believe

D Confidence

SYSTEM OF UNITS

FUNDAMENTAL QUANTITY	SI UNIT	SYMBOL
Length		
Mass		
Time		
Temperature		
Amount of substance		
Electric current		
Luminous intensity		

Question

Which of the following group of physical quantity can be considered as a group of fundamental physical quantity?

A Mass, Momentum, Velocity

B Displacement, Time, Velocity

C Force, Mass, Acceleration

D Time, Force, Velocity

Question

Which of the following group of physical quantity can be considered as a group of fundamental physical quantity?

A Mass, Velocity, impulse

B Distance , Time, speed

C Force, acceleration, mass

D Pressure, force , length

Question

The angle of 2' (minute of arc) in radian is nearly equal to

A 5.82×10^{-4} rad

B 4.85×10^{-4} rad

C 4.80×10^{-6} rad

D 1.75×10^{-2} rad

Question

The angle of 4'' (second of arc) in radian is nearly equal to

A 5.82×10^{-6} rad

B 4.85×10^{-5} rad

C 4.80×10^{-6} rad

D 1.94×10^{-5} rad

Question

The parallax of distant planets as measured from two diametrically opposite ends of Earth is 1 minute. The distance of planet from earth is (R = 6400 km)

A 6.8×10^{10} m

B 2.2×10^{10} m

C 4.4×10^{10} m

D 8.4×10^{10} m

Question

The parallax of distant star as measured from two diametrically opposite ends of Earth is 25". The distance of planet from earth is (R = 6400 km)

A 1.1×10^{11} m

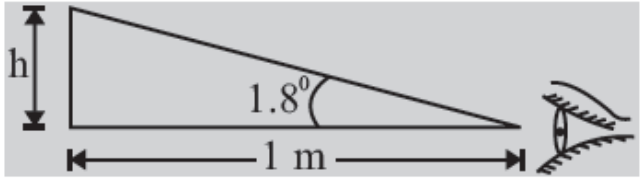
B 2.2×10^{12} m

C 4.4×10^{10} m

D 8.4×10^{11} m

HOMEWORK FROM YAKEEN MODULE

11. A normal human eye can see an object making an angle of $1.8°$ at the eye. What is the approximate height of object which can be seen by an eye placed at a distance of 1 m from the object?



(1) π cm (2) 2π cm

(3) 4π cm (4) 3π cm

(Yakeen NEET Physics M-1)

14. The angle of $1'$ (minute of arc) in radian is nearly equal to **(2020 Covid Re)**

(1) 4.85×10^{-4} rad (2) 4.80×10^{-6} rad

(3) 1.75×10^{-2} rad (4) 2.91×10^{-4} rad

(Yakeen NEET Physics M-1)

Question

The distance of the Sun from earth is 1.5×10^{11} m and its angular diameter is (2000”) when observed from the earth. The diameter of the Sun will be:

A 2.45×10^{10} m

B 1.45×10^{10} m

C 1.45×10^{9} m

D 0.14×10^{9} m

UNITS OF LENGTHS

Some practical units of length are:

1 parsec	1 parsec $= 3.08 \times 10^{16}$ m
Light year (ly)	1ly $= 9.46 \times 10^{15}$ m
1 A. U(distance between sun and earth)	1 A. U $= 1.496 \times 10^{11}$ m
fermi	1fm $= 10^{-15}$ m
angstrom (Å)	1Å $= 10^{-10}$ m
nanometre (nm)	1 nm $= 10^{-9}$ m
micron (μm)	1μm $= 10^{-6}$ m

UNITS OF Mass

Atomic mass unit (amu)	$1\text{amu} = 1.66 \times 10^{-27}$ kg
Quintal	1 Quintal = kg
Metric tonne	1 Tonne = kg

DIMENSIONS

Quantity	Unit	Dimension
Distance		
Displacement		
Radius, diameter , circumference		
Area		
Volume		
Density		
velocity , speed		

DIMENSIONS

Quantity	Unit	Dimension
Acceleration		
Force		
Temperature gradient		
Work		
Kinetic energy		
Pressure		
frequency, angular frequency		

DIMENSIONS

Quantity	Unit	Dimensions
Linear momentum, IMPULSE		
Angular momentum, Planck's constant		
Refractive index		
Density		
Stress		
Strain		
Young's modulus		

Torque	
Surface Tension (S)	
Surface energy	
Power	
Torque (τ)	

Charge	
Charge density	
Gravitation constant	
Coefficient of viscosity	

Voltage	**P/I**	
Resistance	P/I^2	
Capacitance	Q/V	

Question

Dimensions of gravitational constant are:

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

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

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

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

Question

The dimensions of physical quantity X in the equation, pressure $= \frac{X}{\text{volume}}$ is given by

A M^1LT^{-2}

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

C ML^2T^{-2}

D $M1L^{-2}T^{-1}$

HOMEWORK FROM YAKEEN MODULE

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

(1) Second (2) Minute

(3) Year (4) Light year

(Yakeen NEET Physics M-1)

20. The dimensions of potential are the same as that of:

(1) Work

(2) Electric field per unit charge

(3) Work per unit charge

(4) Force per unit charge

(Yakeen NEET Physics M-1)

HOMEWORK FROM YAKEEN MODULE

12. The pair having the same dimensions are:

(1) Angular momentum, work

(2) Work, torque

(3) Potential energy, linear momentum

(4) Kinetic energy, velocity

(Yakeen NEET Physics M-1)

1. Select the pair whose dimensions are same.

(1) Pressure and stress

(2) Momentum and impulse

(3) Torque and energy

(4) All of these

(Yakeen NEET Physics M-1)

Voltage	**P/I**	
Resistance	P/I^2	
Capacitance	Q/V	

Question

The dimensions of physical quantity X in the equation, force $= \frac{X}{\text{velocity}}$ is given by

A M^1LT^{-3}

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

C ML^2T^{-3}

D $M1L^{-2}T^{-1}$

Question

If E and G respectively denote energy and gravitational constant, then E/G has the dimensions of: **(2021)**

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

B $[M][L^{0}][T^{0}]$

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

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

Question

(2020)

Dimensions of stress are :

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

B $[ML^0T^{-2}]$

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

D $[MLT^{-2}]$

4. A physical quantity $\vec{S}$ is defined as $\vec{S} = (\vec{E} \times \vec{B}) / \mu_0$, where $\vec{E}$ is electric field, $\vec{B}$ is magnetic field and μ_0 is the permeability of free space. The dimensions of $\vec{S}$ are the same as the dimensions of which of the following quantity (ies)? **[JEE Adv, 2021]**

(a) $\dfrac{\text{Energy}}{\text{Charge} \times \text{Current}}$

(b) $\dfrac{\text{Force}}{\text{Length} \times \text{Time}}$

(c) $\dfrac{\text{Energy}}{\text{Volume}}$

(d) $\dfrac{\text{Power}}{\text{Area}}$

Question

Suppose refractive index μ is given as:

$$\mu = A + \frac{B}{\lambda^2}$$

Where A and B are constants and λ is the wavelength, then dimensions of B are same as that of:

A. Wavelength

B. Volume

C. Pressure

D. Area

Question

In the relation: $\frac{dy}{dt} = a\omega\sin(\omega t + \phi_0)$, the dimensional formula for $(\omega t + \phi_0)$ is:

A $[MLT]$

B $[MLT^0]$

C $[ML^0T^0]$

D $[M^0L^0T^0]$

Question

In the relation :
$y = a \sin(\omega t - kx)$,
The dimensional formula for k is

A $[M^0LT]$

B $[M^0L^{-1}T^0]$

C $[M^0LT^{-1}]$

D $[M^0L^{-1}T^{-1}]$

EXPONENTIAL FUNCTIONS

$P = P_0 \exp(-\alpha t^2)$, here P is pressure and t is time

Question

The position of a particle at time t, is given by the equation, $x(t) = \frac{v_0}{\alpha}(1 - e^{-\alpha t})$, where v_0 is a constant and $\alpha > 0$. The dimensions of v_0 & α are respectively.

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

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

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

D $M^1L^1T^{-1}$ & LT^{-2}

Voltage	**P/I**	
Resistance	P/I^2	
Capacitance	Q/V	

Question

(2012 Mains)

The dimensions of $(\mu_0\varepsilon_0)^{-1/2}$ are:

A $[L^{1/2}T^{-1/2}]$

B $[L^{-1}T]$

C $[LT^{-1}]$

D $[L^{1/2}T^{1/2}]$

Question

If area (A), velocity (V) and density (ρ) are taken as fundamental units, what is the dimensional formula for force?

A $[AV^2\rho]$

B $[A^2 V\rho]$

C $[AV^2]$

D $[AV\rho]$

Question

If speed of light (c), acceleration due to gravity (g) and pressure (P) are taken as fundamental units, the dimensions of gravitational constant (G) are:

A $c^0 gP^{-3}$

B $c^2 g^3 P^{-2}$

C $c^0 g^2 P^{-1}$

D $c^2 g P^{-2}$

Question

If energy (E), velocity (V) and force (F) be taken as fundamental quantity, then what are the dimensions of mass:

A EV^{2}

B EV^{-2}

C EV^{-3}

D EV^{-4}

Question

If force [F], acceleration [A] and time [T] are chosen as the fundamental physical quantities. Find the dimensions of energy. **(2021)**

A $[F][A][T^2]$

B $[F][A][T^{-1}]$

C $[F][A^{-1}][T]$

D $[F][A][T]$

Question

Planck's constant (h), speed of light in vacuum (c) and Newton's gravitational constant (G) are three fundamental constants. Which of the following combinations of these has the dimension of length? **(2016 - II)**

A $\sqrt{\frac{hc}{G}}$

B $\sqrt{\frac{Gc}{h^{3/2}}}$

C $\frac{\sqrt{hG}}{c^{3/2}}$

D $\sqrt{\frac{hG}{c^{5/2}}}$

Question

If dimension of critical velocity of liquid flowing through a tube are expressed as $v_c \propto [\eta^x \rho^y r^z]$ where η, ρ and r are the coefficient of viscosity of liquid, density of liquid and radius of the tube respectively, then the values of x, y and z are given by: **(2015 - Re)**

A 1, 1, 1

B 1, –1, –1

C –1, –1, 1

D –1, –1, –1

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

[JEE Adv, 2023]

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

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

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

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

27. In a particular system of units, a physical quantity can be expressed in terms of the electric charge e, electron mass m_e, Planck's constant h, and coulomb's constant $k = \frac{1}{4\pi\varepsilon_0}$, where ε_0 is the permittivity of vacuum. In terms of these physical constants, the dimension of the magnetic field is $[B] = [e]^{\alpha} [m_e]^{\beta} [h]^{\gamma} [k]^{\delta}$. The value of $\alpha + \beta + \gamma + \delta$ is _____. **[JEE Adv, 2022]**

20. The dimensions of potential are the same as that of:

(1) Work

(2) Electric field per unit charge

(3) Work per unit charge

(4) Force per unit charge

(Yakeen NEET Physics M-1)

In a typical combustion engine the work done by a gas molecule is given by $W = \alpha^2 \beta e^{-\frac{\beta x^2}{kT}}$, where x is the displacement, k is the Boltzmann constant and T is the temperature. If α and β are constants, dimensions of α will be:

[26 Feb, 2021 (Shift-I)]

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

Let us consider a system of units in which mass and angular momentum are dimensionless. If length has dimension of L, which of the following statement(s) is/are correct? **[JEE Adv, 2019]**

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

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

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

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

The equation of state of a real gas is given by $\left(P+\frac{a}{V^2}\right)(V-b)=RT$, where P, V and T are pressure. volume and temperature respectively and R is the universal gas constant. The dimensions of $\frac{a}{b^2}$ is similar to that of:

[27 Jan, 2024 (Shift-II)]

(a) PV (b) P (c) RT (d) R

28. If time (t), velocity (v), and angular momentum (ℓ) are taken as the fundamental units. Then the dimension of mass (m) in terms of t, v,and ℓ is: **[20 July, 2021 (Shift-II)]**

(*a*) $[t^{-2}\,v^{-1}\,\ell^{1}]$ (*b*) $[t^{-1}\,v^{1}\,\ell^{-2}]$

(*c*) $[t^{-1}\,v^{-2}\,\ell^{1}]$ (*d*) $[t^{1}\,v^{2}\,\ell^{-1}]$

Question

Convert 1N and 1 J into cgs system

Question

In a particular system, the unit of length, mass and time are chosen to be 10 cm, 10 g and 0.1sec respectively. The unit of force in this system will be equivalent to:

A 0.1 N

B 1 N

C 10 N

D 100 N

Question

Find the value of 60 J per min on a system that has base units of mass as 100g, length as 100 cm and time as 1 min as fundamental units

HOMEWORK FROM YAKEEN MODULE

15. Match List-I with List-II

List-I		List-II	
A.	Spring constant	I.	(T^{-1})
B.	Angular speed	II.	(MT^{-2})
C.	Angular momentum	III.	(ML^2)
D.	Moment of Inertia	IV.	(ML^2T^{-1})

Choose the correct answer from the options given below:

[12 April, 2023 (Shift-I)]

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

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

HOMEWORK FROM YAKEEN MODULE

20. Applying the principle of homogeneity of dimensions, determine which one is correct.
where T is time period, G is gravitational constant, M is mass, r is radius of orbit. **[04 April, 2024 (Shift-II)]**

(a) $T^2 = \frac{4\pi^2 r}{GM^2}$ (b) $T^2 = 4\pi^2 r^3$

(c) $T^2 = \frac{4\pi^2 r^3}{GM}$ (d) $T^2 = \frac{4\pi^2 r^2}{GM}$

21. Consider two physical quantities A and B related to each other as $E = \frac{B - x^2}{At}$ where E, x and t have dimensions of energy, length and time respectively. The dimension of AB is **[31 Jan, 2024 (Shift-II)]**

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

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

14. Match List-I with List-II. **[30 Jan, 2024 (Shift-I)]**

	List-I		List-II
A.	Coefficient of viscosity	I.	$[ML^2T^{-2}]$
B.	Surface Tension	II.	$[ML^2T^{-1}]$
C.	Angular momentum	III.	$[ML^{-1}T^{-1}]$
D.	Rotational kinetic energy	IV.	$[ML^0T^{-2}]$

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

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

15. Match List-I with List-II

List-I		List-II	
A.	Spring constant	I.	(T^{-1})
B.	Angular speed	II.	(MT^{-2})
C.	Angular momentum	III.	(ML^2)
D.	Moment of Inertia	IV.	(ML^2T^{-1})

Choose the correct answer from the options given below: **[12 April, 2023 (Shift-I)]**

Question

The dimensions formula for latent heat is:

A $[M^0 L^2 T^{-2}]$

B $[MLT^{-2}]$

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

D $[ML^2 T^{-1}]$

Question

In a particular system, the unit of length, mass and time are chosen to be 10 cm, 10 g and 0.1sec respectively. The unit of force in this system will be equivalent to:

A 0.1 N

B 1 N

C 10 N

D 100 N

Question

The Young's modulus of steel is 1.9×10^{11} N/m^2. When expressed in CGS units of dyne/cm^2, it will be equal to (1 N = 10^5 dyne, 1 m^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}

Question

The number of significant figures in the measured value 0.0204 is

A Five

B Three

C Four

D Two

Question

The respective number of significant figures for the numbers 6.320, 6.032, 0.0006032 are

A 3, 4, 8

B 4, 4, 8

C 4, 4, 4

D 4, 3, 4

Question

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

Question

A cube has a side 1.2×10^{-2} m. Its volume will be recorded as

A $1.728 \times 10^{-6}\ m^3$

B $1.72 \times 10^{-6}\ m^3$

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

D $72 \times 10^{-6}\ m^3$

Question

3.1421 + 0.241 + 0.09 is equal to (after rounding off two decimal place)

A 3.43

B 3.47

C 3.48

D 3.46

Question

Subtract 0.2 J from 5.27 J and express the result with correct number of significant figures:

A 5.1 J

B 5.06 J

C 5.0 J

D 5 J

Question

When 10 observations are taken, the random error is x, When 100 oberservations are taken, the random error becomes

A x/10

B x

C 10x

D 100x

HOMEWORK FROM YAKEEN MODULE

38. The number of significant figures in 0.06900 is:

(1) 5 (2) 4 (3) 2 (4) 3

(Yakeen NEET Physics M-1)

39. If the length of rod A is 3.25 ± 0.01cm and that of rod B is 4.19 ± 0.01cm, then the rod B is longer than rod A by:

(1) 0.94 ± 0.00 cm (2) 0.94 ± 0.01 cm

(3) 0.94 ± 0.02 cm (4) 0.94 ± 0.005 cm

(Yakeen NEET Physics M-1)

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

(1) 663.821 (2) 664 (3) 663.8 (4) 663.82

(Yakeen NEET Physics M-1)

29. The dimensions of "K" in equation $W = \frac{1}{2}Kx^2$ is:

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

(3) $[M^1 L^1 T^{-2}]$ (4) $[M^1 L^0 T^{-1}]$

(Yakeen NEET Physics M-1)

30. $\frac{h}{2\pi}$ has the dimension of:

(1) Velocity (2) Momentum

(3) Energy (4) Angular momentum

(Yakeen NEET Physics M-1)

HOMEWORK FROM YAKEEN MODULE

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(1) Velocity (2) Momentum

(3) Energy (4) Angular momentum

(Yakeen NEET Physics M-1)

Question

In an experiment, the period of oscillation of a simple pendulum was observed to be 2.63 s, 2.56 s, 2.42 s, 2.71 s and 2.80 s. The mean value in observations are

A 2.624 s

B 2.60 s

C 2.62 s

D 2 s

Question

In an experiment, the period of oscillation of a simple pendulum was observed to be 2.63 s, 2.56 s, 2.42 s, 2.71 s and 2.80 s. The absolute errors in observations are

Question

In an experiment, the period of oscillation of a simple pendulum was observed to be 2.63 s, 2.56 s, 2.42 s, 2.71 s and 2.80 s. The mean absolute errors is

A 0.11 s

B 0.12 s

C 1.13 s

D 0.14 s

Question

In an experiment, the period of oscillation of a simple pendulum was observed to be 2.63 s, 2.56 s, 2.42 s, 2.71 s and 2.80 s. The percentage error is

A 3

B 4

C 5

D 6

Question

The sides of a rectangle are (5.181 ± 0.3) m and (17.81 ± 0.6) m. Find their-sum with error limits.

A 21.99 ± 0.9m

B 22.98 ± 0.9m

C 23.99 ± 0.9m

D 22.99 ± 0.9m

Question

The length of a rod is $(15.05 \pm 0.05)cm$. What is the length of two rods?

A $(31.1 \pm 0.05)cm$

B $(30.1 \pm 0.2)cm$

C $(32.10 \pm 0.05)cm$

D $(30.10 \pm 0.10)cm$

Question

The initial and final temperatures of a liquid are measured to be (67.7 ± 0.2) °C and (76.3 ± 0.3) °C. Calculate the rise in temperature.

A (8.7 ± 0.5) °C

B (8.6 ± 0.4) °C

C (8.6 ± 0.5) °C

D (8.6 ± 0.3) °C

Question

If voltage V = (100 ± 5)V and current I = (10 ± 0.2)A, the percentage error in resistance R is:

A 5.2%

B 25%

C 7%

D 10%

Question

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

A (0.25 ± 0.08) m

B (0.25 ± 0.5) m

C (0.25 ± 0.05) m

D (0.25 ± 0.135) m

HOMEWORK FROM YAKEEN MODULE

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HOMEWORK FROM YAKEEN MODULE

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B $(30.1 \pm 0.2)cm$

C $(32.10 \pm 0.05)cm$

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Question

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A (8.7 ± 0.5) °C

B (8.6 ± 0.4) °C

C (8.6 ± 0.5) °C

D (8.6 ± 0.3) °C

Question

If $x = a^3$, the maximum percentage error in the measurement of x will be:

A $\left(\frac{3\Delta a}{a} \times 100\%\right)$

B $\left(\frac{\Delta a}{a} \times 100\%\right)$

C $\left(\frac{2\Delta a}{a}\right) \times 100\%$

D $\left(\frac{\Delta a}{3a}\right) \times 100\%$

Question

If $x = a^2b$, the maximum percentage error in the measurement of x will be:

A $\left(\frac{2\Delta a}{a} \times 100\%\right) \times \left(\frac{\Delta b}{b} \times 100\%\right)$

B $\left(\frac{2\Delta a}{a} \times 100\%\right) \div \left(\frac{\Delta b}{b} \times 100\%\right)$

C $\left(\frac{2\Delta a}{a} - \frac{\Delta b}{b}\right) \times 100\%$

D $\left(\frac{2\Delta a}{a} + \frac{\Delta b}{b}\right) \times 100\%$

Question

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

A 12%

B 7%

C 5%

D 14%

Question

If $Z = \frac{A^2B^3}{C^4}$, then the relative error in Z will be:

[25 June, 2022 (Shift-I)]

A $\frac{\Delta A}{A} + \frac{\Delta B}{B} + \frac{\Delta C}{C}$

B $\frac{2\Delta A}{A} + \frac{3\Delta B}{B} - \frac{4\Delta C}{C}$

C $\frac{2\Delta A}{A} + \frac{3\Delta B}{B} + \frac{4\Delta C}{C}$

D $\frac{\Delta A}{A} + \frac{\Delta B}{B} - \frac{\Delta C}{C}$

Question

A quantity is represented by $X = M^a L^b T^c$. The percentage error in measurement of M, L and T are $\alpha\%$, $\beta\%$ and $\gamma\%$ respectively. The percentage error in X would be

A $(\alpha a + \beta b + \gamma c)\%$

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

C $(\alpha a - \beta b - \gamma c)\%$

D None of these

Question

Time period of a pendulum is the time taken by pendulum for one complete oscillation. If time taken by pendulum for one 20 oscillations is 50s measured by a clock of least count 1s, find percentage error in measurement of time period ?

Question

The period of oscillation of a simple pendulum is $T = 2\pi\sqrt{L/g}$. Measured value of L is 20.0 cm known to 1 mm accuracy and time for 100 oscillations of the pendulum is found to be 200 s using a wrist watch of 1 s resolution. What is the accuracy in the determination of g?

A 2 %

B 1.5 %

C 3 %

D None of these

Question

A physical quantity A is related to three observation a, b and c follows, $A = \frac{b-a}{c}$. Measured value of b is (10.00 ± 0.05)cm, a is(5.00 ± 0.15)cm c is(1.00 ± 0.01)cm. What is the percentage error in the measurement of quantity A?

A 12%

B 7%

C 5%

D 14%

Question

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

A 1%

B 3%

C 5%

D 7%

Question

The density of a cube is measured by measuring its mass and length of its sides. If the maximum errors in the measurement of mass and length are 4% and 3% respectively, the maximum error in the measurement of density would be:

A 9%

B 13%

C 12%

D 7%

Question

If the error in measurement of momentum of particle is 100% then error in the measurement of kinetic energy?

A 150%

B 200%

C 500%

D 300%

Question

The heat generated in a circuit is dependent upon the resistance, current and time for which the current is flown. If the error in measuring the above are as 3%, 4% and 1% the maximum error in measuring heat will be-

A 2%

B 3%

C 6%

D 12%

Question

The heat generated in a circuit is dependent upon the resistance, current and time for which the current is flown. If the error in measuring the above are as 3%, 4% and 1% the maximum error in measuring heat will be-

A 2%

B 3%

C 6%

D 12%

Question

Two resistors of resistances $R_1 = 100 \pm 3\text{ohm}$ and $R_2 = 200 \pm 4\text{ohm}$ are connected (a) in series, (b) in parallel. Find the equivalent resistance of the (a) series combination, (b) parallel combination. Use for (a) the relation $R = R_1 + R_2$ and for (b) $\frac{1}{R'} = \frac{1}{R_1} + \frac{1}{R_2}$ and $\frac{\Delta R'}{R'^2} = \frac{\Delta R_1}{{R_1}^2} + \frac{\Delta R_2}{{R_2}^2}$

HOMEWORK FROM YAKEEN MODULE

4. $S_t = u + \frac{1}{2}a(2t-1)$ is:

(1) Only numerically correct

(2) Only dimensionally correct

(3) Both numerically and dimensionally correct

(4) Neither numerically nor dimensionally correct

(Yakeen NEET Physics M-1)

Question

On a main scale 1 cm mark is divided into 10 equal divisions. Find 1 VSD, when 20 VSD coincide with 18 MSD.

A 0.9 cm

B 0.9 mm

C 1 cm

D 0.8 mm

Question

On a main scale 1 cm mark is divided into 10 equal divisions. Find 1 VSD, when 10 VSD coincide with 9 MSD. Find the least count

A 0.1 cm

B 0.1 mm

C 0.2 cm

D 0.2 mm

Question

On a main scale 1 cm mark is divided into 10 equal divisions. When 20 VSD coincide with 19 MSD. Find the least count

A 0.1 cm

B 0.02 mm

C 0.05 mm

D None of these

Question

In a vernier calipers, one main scale division is x cm and n division of the vernier scale coincide with (n – 1) divisions of the main scale. The least count (in cm) of the callipers is

A $(n - 1/n)x$

B $nx/(n - 1)$

C x/n

D $x/(n - 1)$

Question

If n main scale divisions coincide with (n+1) vernier scale divisions. The least count of vernier callipers, when each centimetre on the main scale is divided into five equal parts, will be.

A $2/(n+1)$ mm

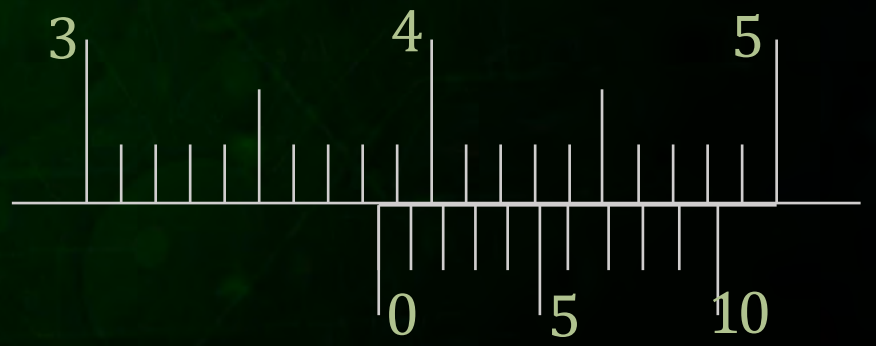
B $5/(n+1)$ mm

C $1/2n$ mm

D $1/5n$ mm

Question

A Vernier calipers have 1 cm divided into 10 equal divisions on the main scale. The Vernier scale of one of the calipers has 10 equal divisions that correspond to 9 main scale divisions. The reading of the caliper is shown in the figure. The measured value (in cm) by calipers is,



A 3.85

B 3.86

C 3.87

D 3.88

Question

A student performs an experiment of measuring the thickness of a slab with a vernier calliper whose 50 divisions of the vernier scale are equal to 49 divisions of the main scale. He noted that zero of the vernier scale is between 7.00 cm and 7.05 cm mark of the main scale and 23^{rd} division of the vernier scale exactly coincides with the main scale. The measured value of the thickness of the given slab using the calliper will be:

A 7.23 cm

B 7.023 cm

C 7.073 cm

D 7.73 cm

Question

The vernier scale used for measurement has a positive zero error of 0.2 mm. If while taking a measurement it was noted that **0** on the vernier scale lies between 8.5 cm and 8.6 cm, vernier coincidence is **6**, then the correct value of measurement is (in cm)
(Least count = 0.01 cm)

A 8.36 cm

B 8.56 cm

C 8.58 cm

D 8.54 cm

Question

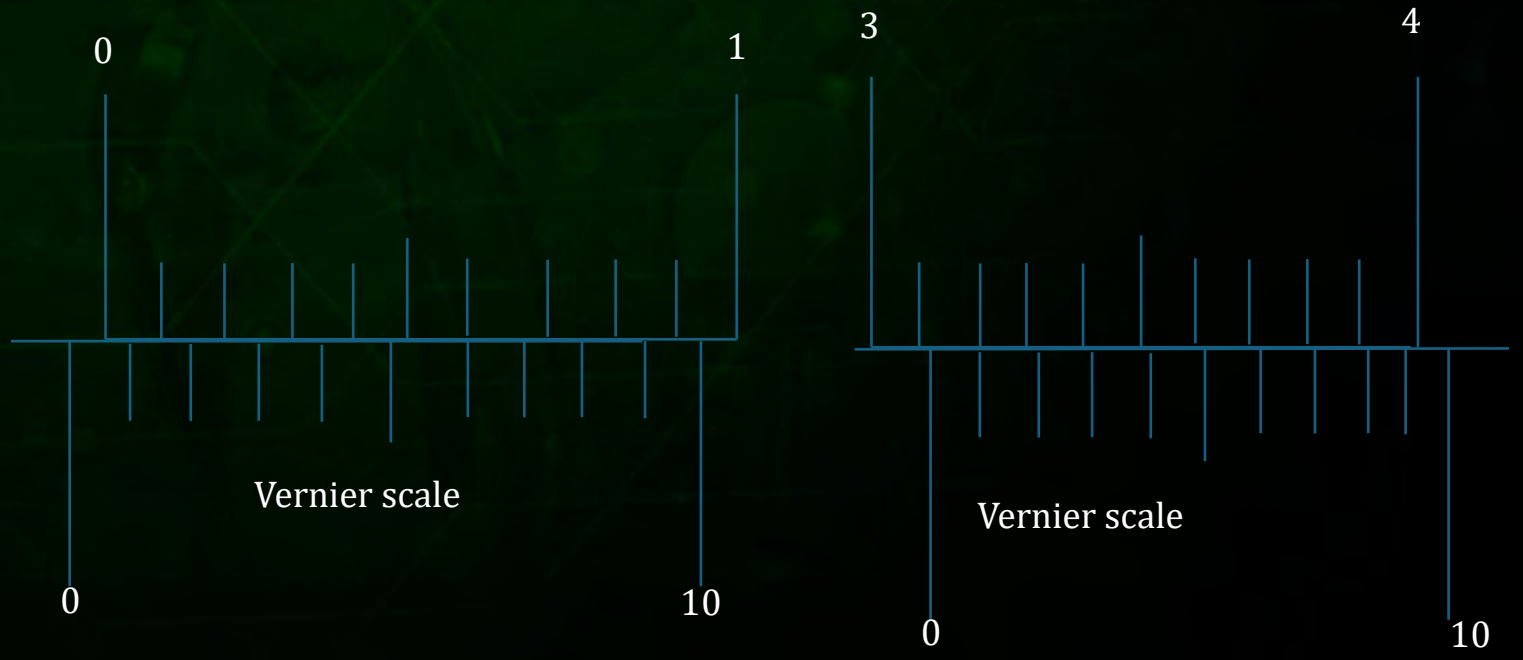
The smallest division on the main scale of a Vernier calipers is 0.1 cm. Ten divisions of the Vernier scale correspond to nine divisions of the main scale. The figure below on the left shows the reading of this calipers with no gap between its two jaws. The figure on the right shows the reading with a solid sphere held between the jaws. The correct diameter of the sphere is

A 3.07 cm

B 3.11 cm

C 3.15 cm

D 3.17 cm



Question

The diameter of a spherical bob is measured using a vernier callipers. 9 divisions of the main scale, in the vernier callipers, are equal to 10 divisions of vernier scale. One main scale division is 1 mm. The main scale reading is 10 mm and 8^{th} division of vernier scale was found to coincide exactly with one of the main scale division. If the given vernier callipers has positive zero error of 0.04 cm, then the radius of the bob is _____ $\times 10^{-2}$ cm.

HOMEWORK FROM YAKEEN MODULE

53. In a vernier calliper, when both jaws touch each other, zero of the vernier scale shifts towards left and its 4th division coincides exactly with a certain division on main scale. If 50 vernier scale divisions equal to 49 main scale divisions and zero error in the instrument is 0.04 mm then how many main scale divisions are there in 1 cm? **[06 April, 2024 (Shift-II)]**

(*a*) 40 (*b*) 5 (*c*) 20 (*d*) 10

54. In finding out refractive index of glass slab the following observations were made through travelling microscope 50 vernier scale division = 49 MSD; 20 divisions on main scale in each cm **[06 April, 2024 (Shift-II)]**

For mark on paper

MSR = 8.45 cm, VC = 26

For mark on paper seen through slab

MSR = 7.12 cm, VC = 41

For powder particle on the top surface of the glass slab

MSR = 4.05 cm, VC = 1

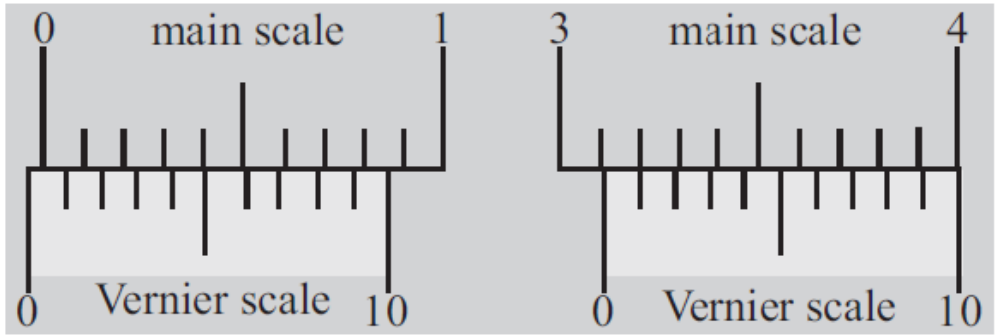
(MSR = Main Scale Reading, VC = Vernier Coincidence)

Refractive index of the glass slab is:

(*a*) 1.42 (*b*) 1.52 (*c*) 1.24 (*d*) 1.35

HOMEWORK FROM YAKEEN MODULE

65. The smallest division on the main scale of a Vernier callipers is 0.1 cm. Ten divisions of the Vernier scale correspond to nine divisions of the main scale. The figure below on the left shows the reading of this calliper with no gap between its two jaws. The figure on the right shows the reading with a solid sphere held between the jaws. The correct diameter of the sphere is **[JEE Adv, 2021]**



(*a*) 3.07 cm (*b*) 3.11 cm (*c*) 3.15 cm (*d*) 3.17 cm

51. Least count of a vernier calliper is $\frac{1}{20N}$ cm. The value of one division on the main scale is 1 mm. Then the number of divisions of main scale that coincide with N divisions of vernier scale is:

[08 April, 2024 (Shift-II)]

(a) $\left(\frac{2N-1}{20N}\right)$

(b) $\left(\frac{2N-1}{2}\right)$

(c) $(2N-1)$

(d) $\left(\frac{2N-1}{2N}\right)$

Question

A screw gauge has the least count of 0.01 mm and there are 50 divisions in its circular scale. What will be the pitch of the screw gauge (in mm)?

A 0.05

B 0.005

C 0.050

D 0.5

Question

The least count of the main scale of a screw gauge is 1 mm. The minimum number of divisions on its circular scale required to measure 5μm diameter of wire is

A 200

B 50

C 500

D 100

Question

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

[27 July, 2021 (Shift-I)]

Reason R : Least count $= \frac{\text{Pitch}}{\text{Total divisions on circular scale}}$

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

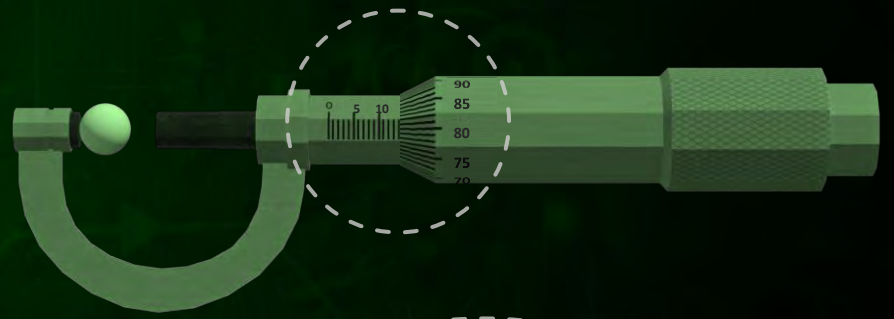
B Both assertion and reason are true but reason is not the correct explanation of the assertion.

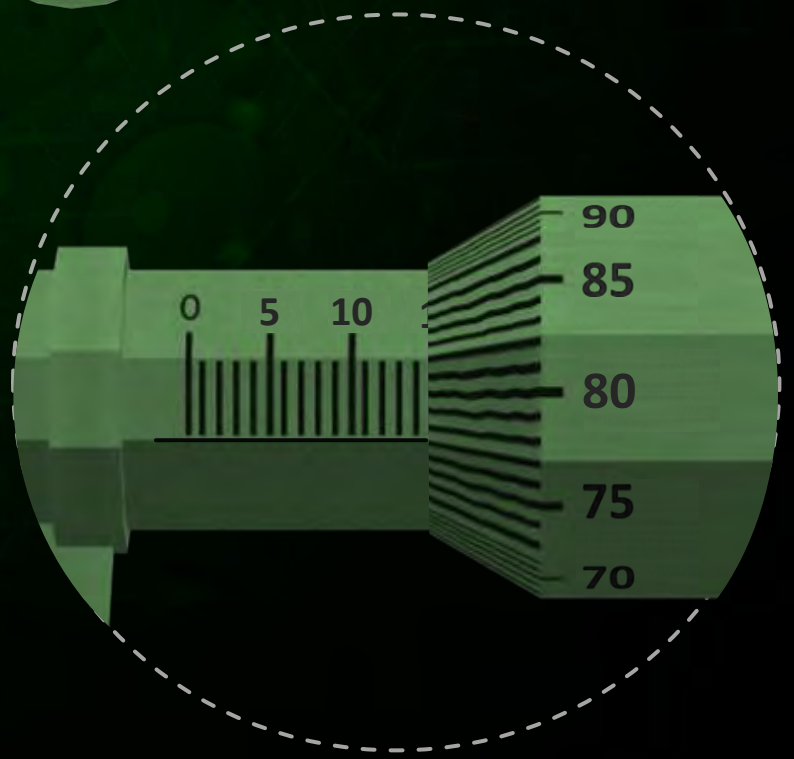
C Assertion is true but reason is false.

D The assertion is false but reason is true.

Question

If a screw moves by 1 mm in **1** rotation and its circular scale has **100** divisions, then find the reading of the screw gauge?





A 14.75 mm

B 14.80 mm

C 14.77 mm

D 14. 70 mm

Question

A screw gauge gives the following readings when used to measure the diameter of a wire Main scale reading: 0 mm Circular scale reading: 52 divisions Given that 1 mm on main scale corresponds to 100 divisions on the circular scale. The diameter of the wire from the above data is:

A 0.026 cm

B 0.26 cm

C 0.052 cm

D 0.52 cm

Question

A screw gauge having 100 equal circular divisions and a pitch of length 1 mm is used to measure the diameter of a wire. The main scale reading is 1 mm and the 47th circular division coincides with the main scale, find the diameter of the wire

A 1.47 mm

B 0.01 mm

C 5.7 mm

D 0.48 mm

Question

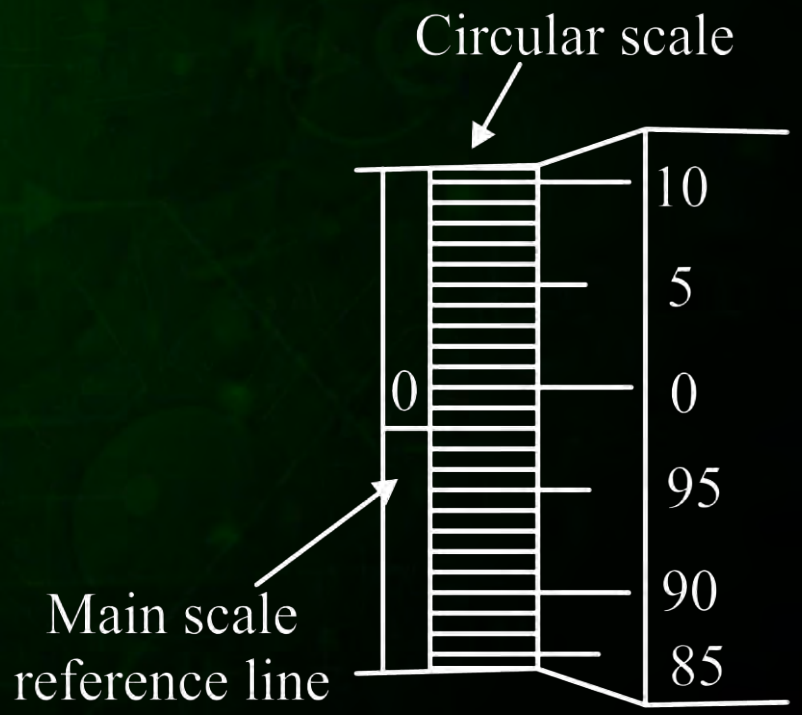
In the given figure zero error will be?

A Nil

B Positive

C Negative

D None of these



Question

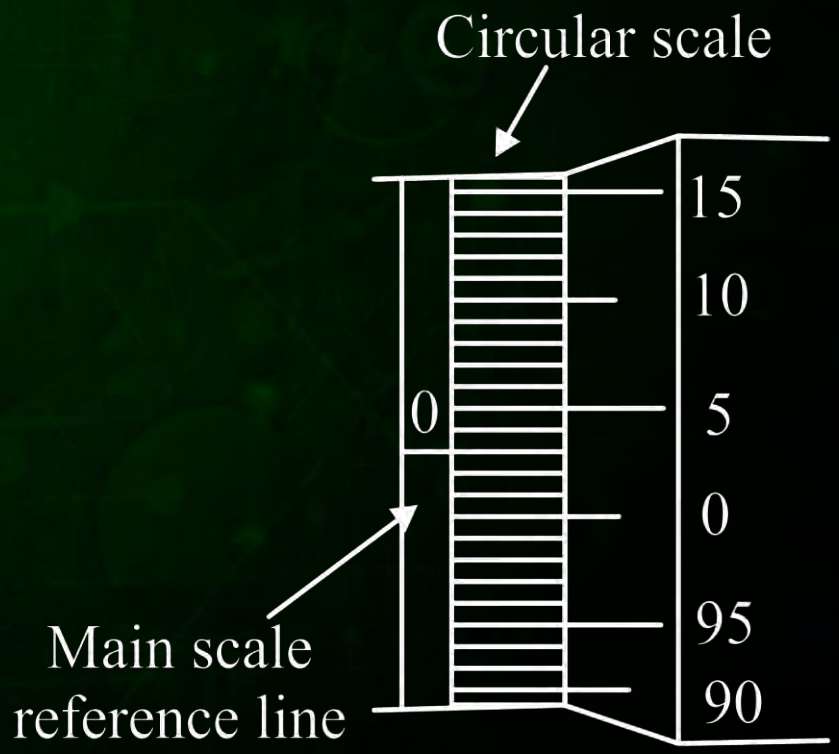
In the given figure zero error will be?

A Nil

B Positive

C Negative

D None of these



Question

A screw gauge with a pitch of 0.5 mm and a circular scale with 50 divisions is used to measure the thickness of a thin sheet of Aluminum. Before starting the measurement, it is found that when the anvil and spindle of the screw gauge are brought in contact, the 45th division coincides with the main scale line, and the zero of the main scale is barely visible. What is the thickness of the sheet if the main scale reading is 0.5 mm and the 25th division coincides with the main scale line?

A 0.50 mm

B 0.75 mm

C 0.80 mm

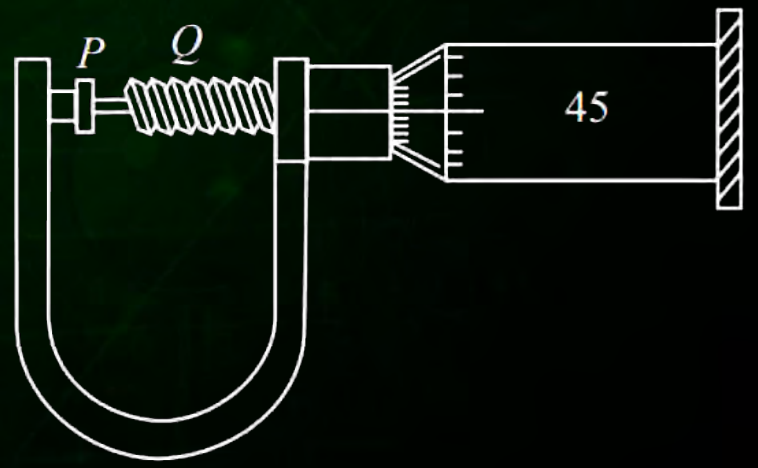
D 0.70 mm

Question

A. Screw moves 0.5 mm or main scale in one complete rotation.
B. Total divisions on circular scale = 50
C. Main scale reading is 2.5 mm
D. 45th division of circular scale is in the pitch line
E. instrument has Negative zero error of 0.03 mm

Then the diameter of wire is

[29 July, 2022 (Shift-I)]



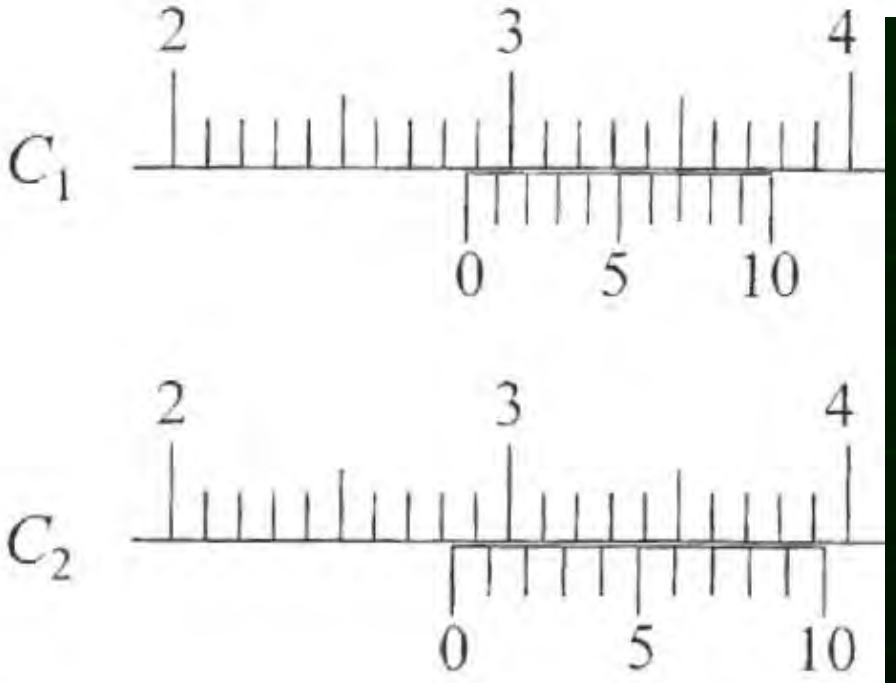
(A) 2.92 mm

(B) 2.54 mm

(C) 2.98 mm

(D) 3.45 mm

6. There are two vernier calipers both of which have 1 cm divided into 10 equal divisions on the main scale. The Vernier scale of one of the calipers (C_1) has 10 equal divisions that correspond to 9 main scale divisions. The Vernier scale of the other caliper (C_2) has 10 equal divisions that correspond to 11 main scale divisions. The readings of the two calipers are shown in the figure. The measured values (in cm) by calipers C_1 and C_2 respectively, are **[JEE-Advance 2016]**



(A) 2.87 and 2.86 (B) 2.87 and 2.87

(C) 2.87 and 2.83 (D) 2.85 and 2.82

HOMEWORK FROM YAKEEN MODULE

50. There are 100 divisions on the circular scale of a screw gauge of pitch 1 mm. With no measuring quantity in between the jaws, the zero of the circular scale lies 5 divisions below the reference line. The diameter of a wire is then measured using this screw gauge. It is found the 4 linear scale divisions are clearly visible while 60 divisions on circular scale coincide with the reference line. The diameter of the wire is: **[08 April, 2024 (Shift-II)]**

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

HOMEWORK FROM YAKEEN MODULE

55. While measuring diameter of wire using screw gauge the following readings were noted. Main scale reading is 1 mm and circular scale reading is equal to 42 divisions. Pitch of screw gauge is 1 mm and it has 100 divisions on circular scale. The diameter of the wire is $\frac{x}{50}$ mm. The value of x is: **[06 April, 2024 (Shift-I)]**

(*a*) 142
(*b*) 71
(*c*) 42
(*d*) 21

53. In a vernier calliper, when both jaws touch each other, zero of the vernier scale shifts towards left and its 4th division coincides exactly with a certain division on main scale. If 50 vernier scale divisions equal to 49 main scale divisions and zero error in the instrument is 0.04 mm then how many main scale divisions are there in 1 cm?

[06 April, 2024 (Shift-II)]

(*a*) 40 (*b*) 5 (*c*) 20 (*d*) 10


THANK
YOU