



PHYSICS

BOOKS - NTA MOCK TESTS

NTA NEET SET 48

Physics

1. The radius of hydrogen atom in its ground state is $5.3 \times 10^{-11} m$. After collision with an electron it is found to have a radius of

$21.2 \times 10^{-11} m$. What is the principle quantum number of n of the final state of the atom ?

A. $n = 4$

B. $n = 2$

C. $n = 16$

D. $n = 3$

Answer: B



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2. If particles are moving with same velocity ,
then maximum de - Broglie wavelength will be
for

A. α - particle

B. β - particle

C. Proton

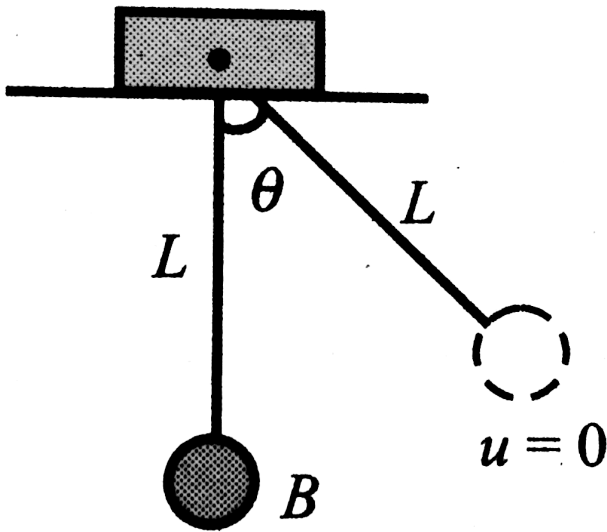
D. Neutron

Answer: B



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3. A small ball B of mass m is suspended with light inelastic string of length L from a block A of same mass in which can move on smooth horizontal surface as shown in the figure. The ball is displaced by angle θ from equilibrium position and then released.



Tension in string when it is vertical, is

A. $\frac{L \sin \theta}{2}$

B. $L \sin \theta$

C. L

D. None of these

Answer: A



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4. A bullet of mass 10 g is fired from a gun of mass 1 kg with recoil velocity of gun 5 m/s. The muzzle velocity will be

A. 0.05 m/s

B. 5 m/s

C. 50 m/s

D. 500 m/s

Answer: D



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5. A particle originally at rest at the highest point of a smooth vertical circle is slightly displaced. It will leave the circle at a vertical distance h below the highest points, such that h is equal to

A. $h = R$

B. $h = R/3$

C. $h = R/2$

D. $h = 2R$

Answer: B



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6. Select the correct statement from the following

A. The magnetic dip is zero at the centre of the earth

B. Magnetic dip decreases as we move away from the equator towards the magnetic pole.

C. Magnetic dip increases as we move away from the equator towards the magnetic pole.

D. Magnetic dip does not vary from place to place

Answer: C



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7. The ratio of the resistances of a conductor at a temperature of $15^{\circ}C$ to its resistance at a temperature of $37.5^{\circ}C$ is 4:5. The temperature coefficient of resistance of the conductor is

A. $\frac{1}{25} \text{ } ^{\circ}C^{-1}$

B. $\frac{1}{50} \text{ } ^{\circ}C^{-1}$

C. $\frac{1}{80} \text{ } ^{\circ}C^{-1}$

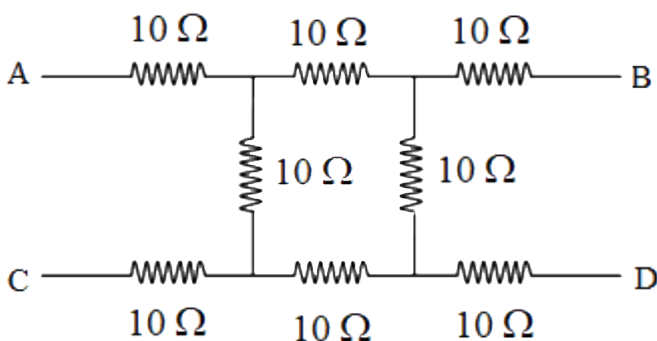
D. $\frac{1}{75} \text{ } ^{\circ}C^{-1}$

Answer: D



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8. What will be the equivalent resistance of circuit shown in figure between two points A and D ?



A. $10\ \Omega$

B. 20Ω

C. 40Ω

D. 30Ω

Answer: D



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9. A current of $2A$ is increasing at a rate of $4A/s$ through a coil of inductance $2H$. The energy stored in the inductor per unit time is

A. 2 J/s

B. 1 J/s

C. 16 J/s

D. 4 J/s

Answer: C



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10. A long solenoid of radius R carries a time dependent current $I = I_0 t(1-t)$. A ring of radius $2R$ is placed coaxially near its centre.

During the time interval $0 \leq t \leq 1$, the induced current I_R and the induced emf V_R in the ring vary as:

A. Direction of I_R remains unchanged and

V_R is maximum at $t = 0.5$

B. At $t = 0.25$ direction of I_R reverses and

V_R is maximum

C. Direction of I_R remains unchanged and

V_R is maximum at $t = 0.25$

D. At $t = 0.5$ direction of I_R reverses and V_R

is zero

Answer: D



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11. An oil drop carrying a charge q has a mass m kg. it is falling freely in air with terminal speed v . the electric field required to make, the drop move upwards with the same speed is

A. $2 \times 10^3 V / m$

B. $4 \times 10^3 V / m$

C. $3 \times 10^3 V / m$

D. $8 \times 10^3 V / m$

Answer: A



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12. Two capacitors, each of capacitance C , are at potentials V_1 and V_2 , respectively. Their negative plates are initially connected, Now ,

when the positive plates are also connected,
find out the loss of energy of the system.

A. 160 J

B. Zero

C. 5 J

D. 1.25 J

Answer: D



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13. If the radius of the earth were to shrink by 1% its mass remaining the same, the acceleration due to gravity on the earth's surface would

A. increase by 0.5 %

B. increase by 2%

C. decrease 0.5%

D. decrease 2%

Answer: B



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14. If a person can jump on the earth surface upto a height 2 m . His jump on a satellite where acceleration due to gravity is $1.96m / s^2$ will be -

A. 5 m

B. 10 m

C. 20 m

D. 2 m

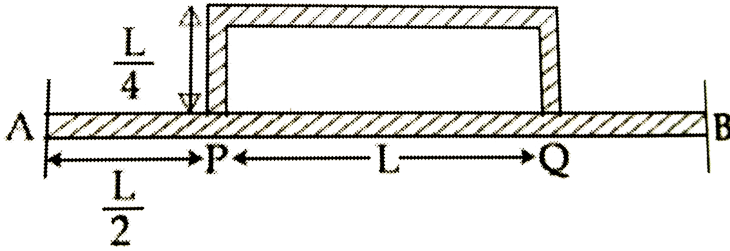
Answer: B



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15. Temperature difference of $120^{\circ}C$ is maintained between two ends of a uniform rod AB of length $2L$. Another bent rod PQ, of same cross-section as AB and length $\frac{3L}{2}$, is connected across AB (See figure). In steady state, temperature difference between P and Q

will be close to :



A. $45^\circ C$

B. $35^\circ C$

C. $60^\circ C$

D. $75^\circ C$

Answer: A



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16. The temperature of equal masses of three different liquids A, B and C are $12^{\circ}C$, $19^{\circ}C$ and $28^{\circ}C$ respectively. The temperature when A and B are mixed is $16^{\circ}C$ and when B and C are mixed it is $23^{\circ}C$. What should be the temperature when A and C are mixed?

A. $18.2^{\circ}C$

B. $22^{\circ}C$

C. $20.2^{\circ}C$

D. $24.2^\circ C$

Answer: C



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17. A monoatomic ideal gas, initially at temperature T_1 , is enclosed in a cylinder fitted with a frictionless piston. The gas is allowed to expand adiabatically to a temperature T_2 by releasing the piston suddenly. If L_1 and L_2 are the lengths of the

gas column before expansion respectively,

then $\frac{T_1}{T_2}$ is given by

A. $(L_1 / L_2)^{2/3}$

B. (L_1 / L_2)

C. (L_2 / L_1)

D. $(L_2 / L_1)^{2/3}$

Answer: D



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18. In a given process on an ideal gas, $dW = 0$ and $dQ < 0$. Then for the gas

- A. The temperature will decrease
- B. The volume will increase
- C. The pressure will remain constant
- D. The temperature will increase

Answer: A



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19. A solenoid of 1.5 metre length and 4.0 cm diameter possesses 10 turn per cm. A current of 10 A is flowing through it . The magnetic induction at axis inside the solenoid is

A. $2\pi \times 10^{-3}T$

B. $2\pi \times 10^{-5}T$

C. $4\pi \times 10^{-2}T$

D. $4\pi \times 10^{-3}T$

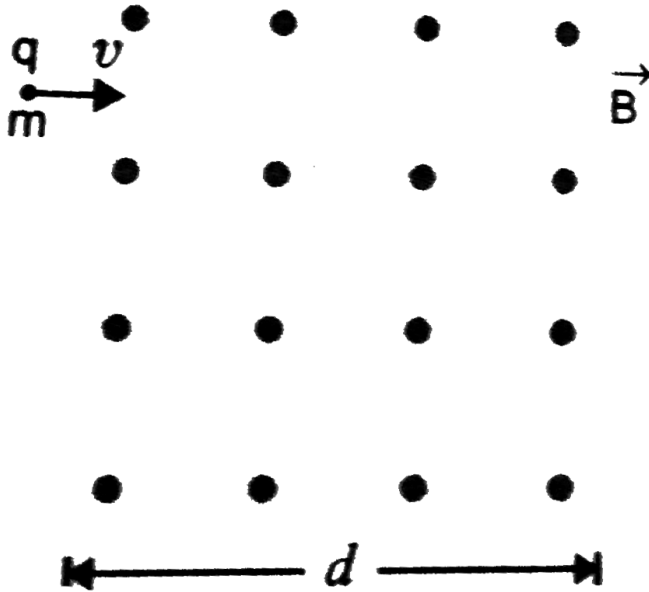
Answer: A



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20. A charged particle of mass m and charge q is projected into a uniform magnetic field of induction \vec{B} with speed v which is perpendicular to \vec{B} . The width of the magnetic field is d . The impulse imparted to

the particle by the field is ($d < \frac{mv}{qB}$)



A. qBv

B. $\frac{mv}{qB}$

C. qBd

D. $\frac{2mv^2}{qB}$

Answer: C



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21. A projectile is thrown with a velocity of 18 m/s at an angle of 60° with horizontal. The interval between the moment when speed is

15 m/s is $\left(g = 10 \frac{m}{s^2}\right)$

A. $\left(\frac{12}{5}\right) S$

B. $\left(\frac{4}{5}\right) S$

C. 12 S

D. $\left(\frac{2}{5}\right)S$

Answer: A



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22. A bomber plane moves horizontally with a speed of $600m/s$ and a bomb released from it, strikes the ground in $10s$. The angle with horizontally at which it strikes the ground will be

A. $\tan^{-1}\left(\frac{1}{5}\right)$

B. $\tan^{-1}\left(\frac{1}{15}\right)$

C. $\tan^{-1}(1)$

D. $\tan^{-1}(5)$

Answer: A



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23. The linear momentum of a particle varies with time t as $p = a + bt + ct^2$. Then, which of the following is correct?

A. Force varies with time in a quadratic manner

B. Force is time - dependent

C. The velocity of the particle is proportional to time

D. The displacement of the particle is proportional to time.

Answer: B



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24. Consider a car moving on a straight road with a speed of 100 m/s . The distance at which car can be stopped is $[\mu_k = 0.5]$

- A. 100 m
- B. 1000 m
- C. 800 m
- D. 400 m

Answer: B



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25. Radio carbon dating is done by estimating in the specimen:

A. Amount of ordinary carbon still present

B. Amount of radio carbon still present

C. Ratio of amount of $^{14}\text{C}_6$ to $^{12}\text{C}_6$ still present

D. Ratio of amount of $^{12}\text{C}_6$ to $^{14}\text{C}_6$ still present

Answer: C



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26. In which of the following decays the element does not change?

A. γ - decays

B. β - decays

C. β^+ decays

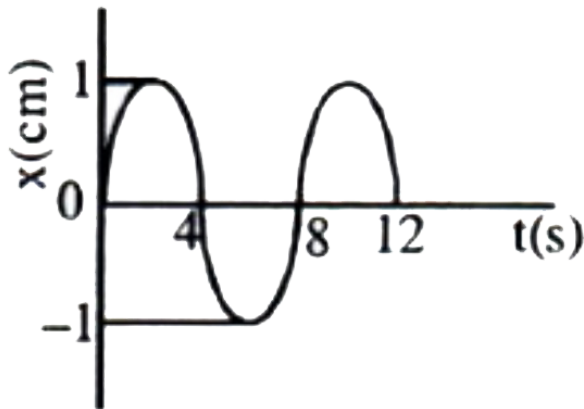
D. α - decays

Answer: A



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27. The x - t graph of a particle undergoing simple harmonic motion is shown below. The acceleration of the particle at $t = \frac{2}{3}$ s is



A. $\frac{\sqrt{3}}{32} \pi^2 \frac{cm}{s^2}$

B. $\frac{-\pi^2}{32} \frac{cm}{s^2}$

C. $\frac{\pi^2}{32} \frac{cm}{s^2}$

D. $-\frac{\sqrt{3}}{32}\pi^2\frac{cm}{s^2}$

Answer: B



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28. A particle moves according to the law $x = a \cos(\pi t/2)$. The distance covered by it in the time interval between $t=0$ to $t=3s$ is

A. r

B. $2r$

C. $3r$

D. $4r$

Answer: C



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29. If the de-Broglie wavelength of a proton is 10^{-13} m, the electric potential through which it must have been accelerated is

A. $4.07 \times 10^4 V$

B. $8.2 \times 10^4 V$

C. $8.2 \times 10^3 V$

D. $4.07 \times 10^5 V$

Answer: B



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30. Radiations of two photon's energy, twice and ten times the work function of metal are incident on the metal surface successively.

The ratio of maximum velocities of photoelectrons emitted in two cases is

A. 1 : 2

B. 1 : 3

C. 1 : 4

D. 1 : 1

Answer: B



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31. If pressure at half the depth of a lake is equal to $\frac{2}{3}$ pressure at the bottom of the lake then what is the depth of the lake ?

A. 10 m

B. 20 m

C. 60 m

D. 30 m

Answer: B



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32. The bulk modulus of water is $2.1 \times 10^9 Nm^{-2}$. The pressure required to increase the density of water by 0.1% is

A. $2 \times 10^9 Nm^{-2}$

B. $2 \times 10^8 Nm^{-2}$

C. $2 \times 10^6 Nm^{-2}$

D. $2 \times 10^6 Nm^{-2}$

Answer: C



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33. Material A has critical angle i_A , and material B has critical angle i_B ($i_B > i_A$).

Then which of the following is true

(i) Light can be totally internally reflected when it passes from B to A

(ii) Light can be totally internally reflected when it passes from A to B

(iii) Critical angle for total internal reflection is $i_B - i_A$

(iv) Critical angle between A and B is

$$\sin^{-1} \left(\frac{\sin i_A}{\sin i_B} \right)$$

A. (i) and (iii)

B. (i) and (iv)

C. (ii) and (iii)

D. (ii) and (iv)

Answer: D



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34. An image is formed at a distance of 100 cm from the glass surface with refractive index 1.5, when a point object is placed in the air at a

distance of 100 cm from the glass surface. The radius of curvature is of the surface is

A. 20 cm

B. 40 cm

C. 30 cm

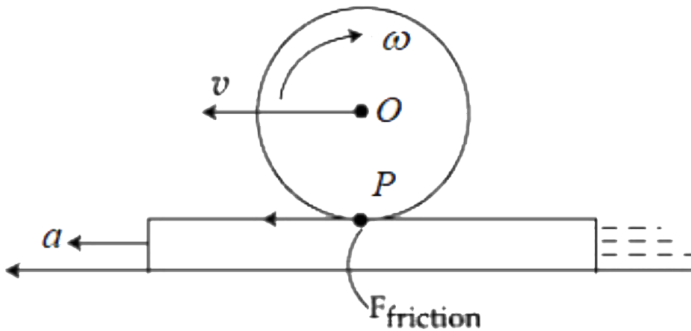
D. 50 cm

Answer: A



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35. Consider a cylinder of mass M resting on a rough horizontal rug that is pulled out from under it with acceleration ' a ' perpendicular to the axis of the cylinder. What is F_{friction} at point P ? It is assumed that the cylinder does not slip.



A. Ma

B. $\frac{Ma}{2}$

C. $\frac{Ma}{3}$

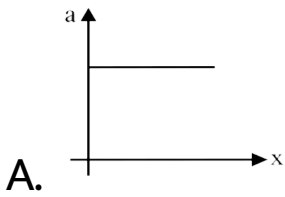
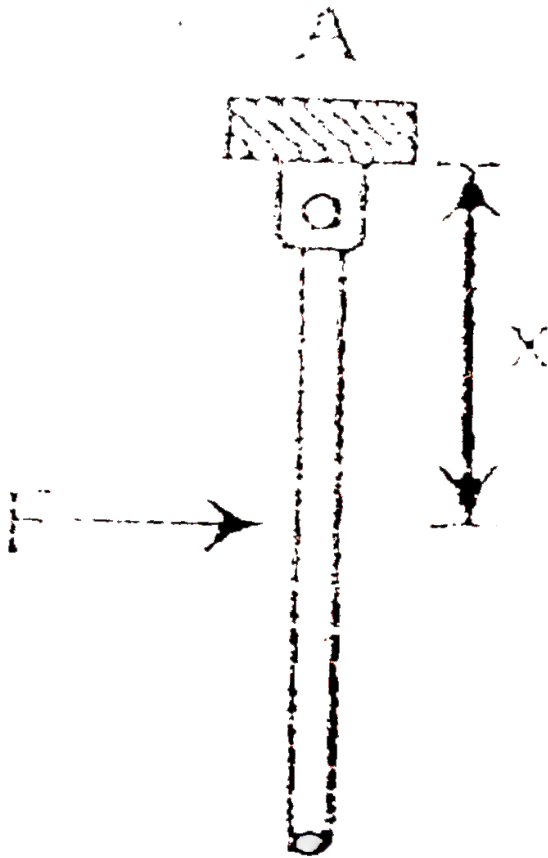
D. Mg

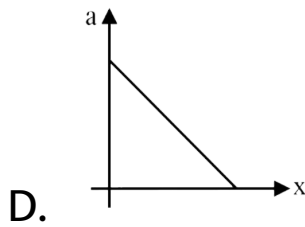
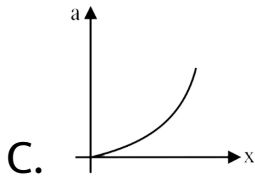
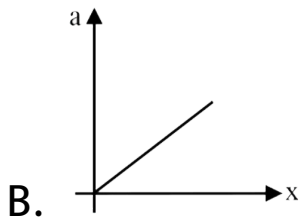
Answer: C



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36. A rod of mass m and length l is hinged at one of its ends A as shown in figure. A force F is applied at a distance x from A . The acceleration of centre of mass varies with x as



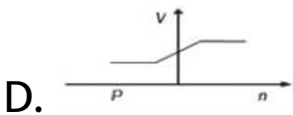
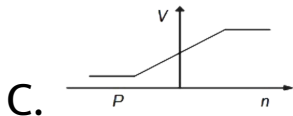
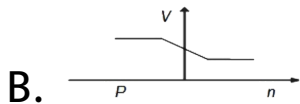
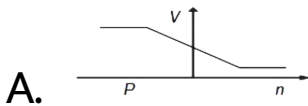


Answer: B



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37. In a forward biased PN - junction diode, the potential barrier in the depletion region is of the from...



Answer: D



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38. The given truth table relates Y to A and B.

A	B	Y
0	0	1
0	1	0
1	0	0
1	1	0

Then, Y is given by

A. $A + B$

B. AB

C. \overline{AB}

D. $\overline{A + B}$

Answer: D



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39. A plate has a length (5 ± 0.1) cm and breadth (2 ± 0.01) cm . Then the area of the plate is

- A. $(10 \pm 0.25)cm^2$
- B. $(10 \pm 0.01)cm^2$
- C. $(10 \pm 0.001)cm^2$
- D. $(10 \pm 1)cm^2$

Answer: A



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40. Which of the following pairs of physical quantities 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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41. In Young's double slit experiment, the ratio of maximum and minimum intensities in the fringe system is 9: 1 the ratio of amplitudes of coherent sources is

A. 9: 1

B. 3: 1

C. 2: 1

D. 1: 1

Answer: C



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42. The angle of incidence at which reflected light is totally polarized for reflection from air to glass (refraction index μ) is

A. $\sin^{-1}(\mu)$

B. $\sin^{-1}\left(\frac{1}{\mu}\right)$

C. $\tan^{-1}\left(\frac{1}{\mu}\right)$

D. $\tan^{-1}(\mu)$

Answer: D



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43. Two instruments having stretched strings are being played in unison . When the tension in one of the instruments is increases by

1%, 3 beats are produced in 2s. The initial frequency of vibration of each wire is

- A. 150 Hz
- B. 200 Hz
- C. 300 Hz
- D. 450 Hz

Answer: C



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44. A pulse of a wavetrain travels along a stretched string and reaches the fixed end of the string. It will be reflected back with

A. A phase change of 180° with speed changed

B. The same phase as the incident pulse with no reversal of velocity

C. A phase change of 180° with no change of speed

D. The same phase as the incident pulse
but with velocity reversed

Answer: C



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