



PHYSICS

BOOKS - NTA MOCK TESTS

NTA NEET SET 88

Physics

1. An electron with kinetic energy $10eV$ is incident on a hydrogen atom in its ground state. The collision

A. Must be elastic

B. May be partially elastic

C. Must be completely inelastic

D. May be completely inelastic

Answer: A



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2. The speed of an electron in the orbit of hydrogen atom in the ground state is

A. c

B. $c/2$

C. $c/10$

D. $c/137$

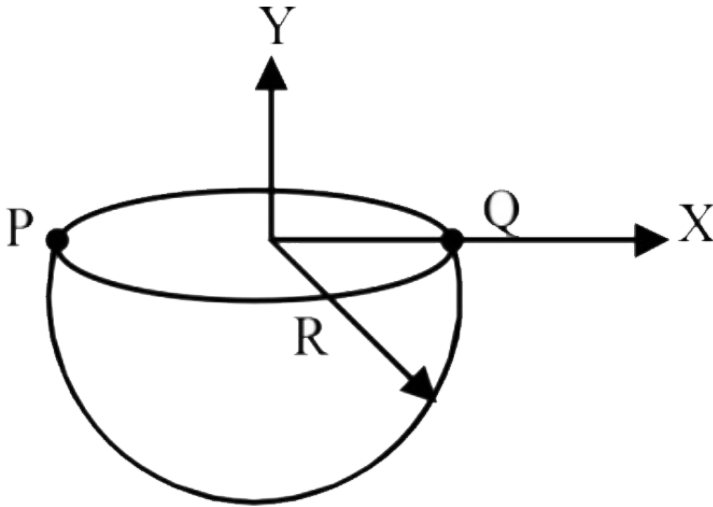
Answer: D



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3. A hollow hemisphere of mass $4m$ is placed as shown in figure . Two point masses m each are fixed to it at points P and Q on

diametrically opposite points. The position of center of mass of the system is



- A. $\left(0, -\frac{R}{2}\right)$
- B. $\left(0, -\frac{R}{3}\right)$
- C. $\left(0, -\frac{2R}{3}\right)$
- D. $\left(0, -\frac{R}{4}\right)$

Answer: B



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4. A cart loaded with sand having total mass $m_0 = 1800\text{kg}$ moves on a straight horizontal road starting from rest under the action of a force of 120N . The sand spills through a small hole in the bottom at a rate of 0.5 kg/sec . What will be the vertically of cart after 20 min ?

A. 120m/s

B. 60 m/s

C. 80m/s

D. 40 m/s

Answer: A



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5. A particle moves along a circle of radius r with constant tangential acceleration. If the velocity of the particle is v at the end of

second revolution, after the revolution has started, then the tangential acceleration is

A. $\frac{v^2}{8\pi r}$

B. $\frac{v^2}{6\pi r}$

C. $\frac{v^2}{4\pi r}$

D. $\frac{v^2}{10\pi r}$

Answer: A



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6. Two tangent galvanometers having coils of the same radius are connected in series. A current flowing in them produces deflections of 60° and 45° respectively. The ratio of the number of turns in the coils is

A. $\left(\frac{4}{3}\right)$

B. $\frac{\sqrt{3} + 1}{1}$

C. $\left(\frac{\sqrt{3} + 1}{\sqrt{3} - 1}\right)$

D. $\frac{\sqrt{3}}{1}$

Answer: D



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7. Four resistances of 10Ω , 60Ω , 100Ω and 200Ω , respectively taken in order are used to form a Wheatstone's bridge. A 15 V battery is connected to the ends of a 200Ω resistance, the current through it will be

A. $7.5 \times 10^{-5}\text{ A}$

B. $7.5 \times 10^{-4}\text{ A}$

C. $7.5 \times 10^{-3}\text{ A}$

D. $7.5 \times 10^{-2} A$

Answer: D



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8. A heater coil is cut into two equal parts and only one part is now used in the heater. The heat generated will now be

A. One fourth

B. Halved

C. Doubled

D. Four times

Answer: C



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9. Coulomb's law is valid for

A. charged particles separated by atomic distances ($10^{-11}m$).

B. charged particles separated by atomic distances ($10^{-15}m$) .

C. charged as well as uncharged particles separated by any distances.

D. charged particles separated by any distance.

Answer: D



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10. Two isolated metallic solid spheres of radii R and $2R$ are charged such that both of these have same charge density σ . The spheres are located far away from each other and connected by a thin conducting wire. Find the new charge density on the bigger sphere.

A. $\frac{3\sigma}{2}$

B. $\frac{5\sigma}{6}$

C. $\frac{6\sigma}{5}$

D. $\frac{2\sigma}{3}$

Answer: B



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11. In a potentiometer experiment the balancing length with a cell is 560 cm. When an external resistance of 10Ω is connected in parallel to the cell, the balancing length changes by 60 cm. Find the internal resistance of the cell.

A. 1.4Ω

B. 1.6Ω

C. 1.12Ω

D. 1.2Ω

Answer: D



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12. In a series LCR circuit, an alternating emf (V) and current (I) are given by the equation

$$V = V_0 \sin \omega t, I = I_0 \sin \left(\omega t + \frac{\pi}{3} \right) \quad \text{The}$$

average power dissipated in the circuit over a cycle of AC is

A. $\frac{V_0 I_0}{2}$

B. $\frac{V_0 I_0}{4}$

C. $\frac{\sqrt{3}}{2} V_0 I_0$

D. Zero

Answer: B



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13. The Value of g on the surface of earth is smallest at the equator because

A. The centripetal force maximum at equator

B. The centripetal force is least at equator

C. The centrifugal force is maximum at equator

D. The angular speed of earth is least at equator

Answer: C



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14. The distance of geostationary satellite from the centre of the earth (radius R) is nearest to

A. $18 R$

B. $10 R$

C. $7 R$

D. $5 R$

Answer: C



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15. One end of a copper rod of length 1.0 m and area of cross-section 10^{-3} is immersed in boiling water and the other end in ice. If the coefficient of thermal conductivity of copper is $92 \text{ cal} / \text{m} - \text{s} - .^\circ \text{ C}$ and the latent heat of ice is $8 \times 10^4 \text{ cal} / \text{kg}$, then the amount of ice which will melt in one minute is

A. $9.2 \times 10^{-3} \text{ kg}$

B. $8 \times 10^{-3} \text{ kg}$

C. $6.9 \times 10^{-3} \text{ kg}$

D. $5.4 \times 10^{-3} \text{ kg}$

Answer: C



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16. The pressure exerted by the gas on the walls of a container is measured by

A. $\left[\frac{1}{3}\right]^{rd}$ of kinetic energy per unit volume
of a gas

B. $\left[\frac{2}{3}\right]^{rd}$ of kinetic energy per unit volume
of a gas

C. $\left[\frac{3}{4}\right]^{th}$ of kinetic energy per unit volume
of a gas

D. $\frac{2}{3} \times$ of kinetic energy per unit volume
of a gas

Answer: B



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17. If the ratio of specific heat of a gas of constant pressure to that at constant volume is γ , the change in internal energy of the mass of gas, when the volume changes from V to $2V$ at constant pressure p is

A. $R/(\gamma - 1)$

B. PV

C. $pV/(\gamma - 1)$

D. $\gamma pV/(\gamma - 1)$

Answer: C



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18. A jet plane having a wing-span of 25 m is travelling horizontally towards East with a speed of 3600 km /hr. If the Earth's magnetic field at the location is 4×10^{-4} T and the angle of dip is 30° , then the potential difference between the ends of the wing is

A. 4 V

B. 5 V

C. 2 V

D. 2.5 V

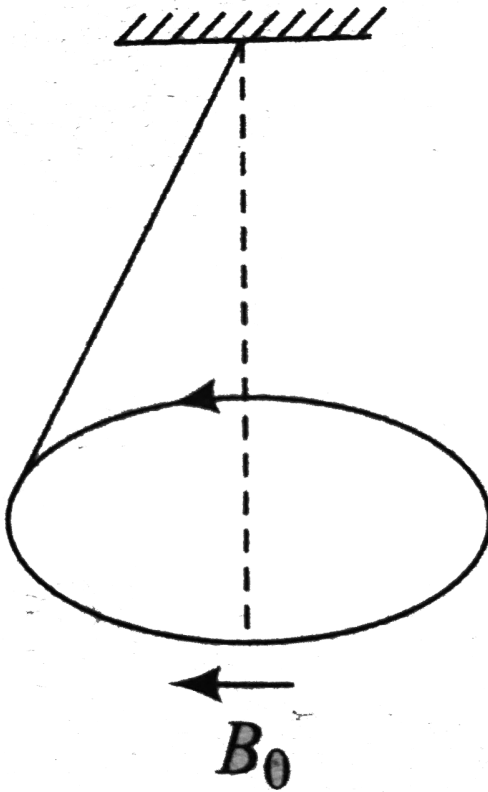
Answer: B



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19. A uniform current carrying ring of mass m and radius R is connected by a massless string as shown in Fig. 1.142. A uniform magnetic field B_0 exists in the region to keep

the ring in horizontal position, then the current in the ring is (l =length of string)



A. $\frac{mg}{\pi R B_0}$

B. $\frac{mg}{R B_0}$

C. $\frac{mg}{3\pi RB_0}$

D. $\frac{mgl}{\pi R^2 B_0}$

Answer: A



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20. For a particle moving in a straight line, the displacement of the particle at time t is given by

$$S = t^3 - 6t^2 + 3t + 7$$

What is the velocity of the particle when its acceleration is zero?

A. $-9ms^{-1}$

B. $-12ms^{-1}$

C. $3ms^{-1}$

D. $42ms^{-1}$

Answer: A



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21. A train of 150m length is going toward north direction at a speed of 10ms^{-1} . A parrot flies at a speed of 5ms^{-1} toward south direction parallel to the railway track. The time taken by the parrot to cross the train is equal to.

A. 12 s

B. 8 s

C. 15 s

D. 10 s

Answer: D



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22. At time t second, a particle of mass 3 kg has position vector r metre, where $r = 3t\hat{i} - 4\cos t\hat{j}$. Find the impulse of the force during the time interval $0 \leq t \leq \frac{\pi}{2}$

A. $12\hat{J}N - s$

B. $9\hat{J}N - s$

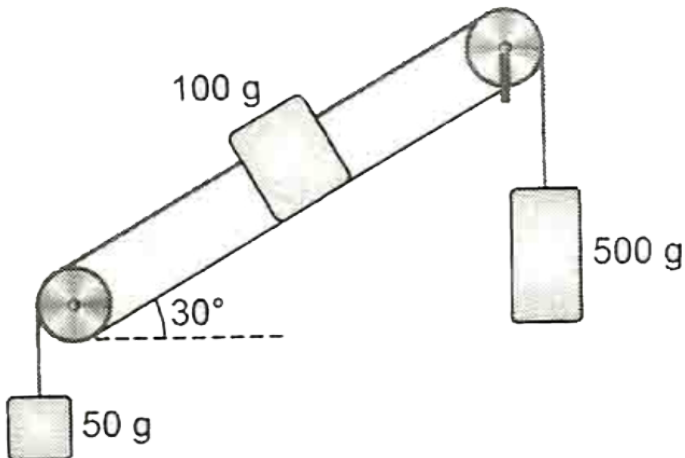
C. $4\hat{J}N - s$

$$D. 14\hat{J}N - s$$

Answer: A

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23. The acceleration of the 500 g block in figure is



A. $\frac{6g}{13}$ downwards

B. $\frac{7g}{13}$ downwards

C. $\frac{8g}{13}$ downwards

D. $\frac{9g}{13}$ downwards

Answer: D



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24. The mean lives of a radioactive substance are 1620 years and 405 years for α emission and β emission respectively. Find out the time

during which three fourth of a sample will decay if it is decaying both by α -emission and β -emission simultaneously. ($\log_e 4 = 1.386$).

A. 449 yrs

B. 399 yrs

C. 549 yrs

D. 579 yrs

Answer: A



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25. The energy released during the fission of 1kg of U^{235} is a E_1 and that product during the fusion of 1 kg of hydrogen is E_2 . If energy released per fission of Uranium - 235 is 200 MeV and that per fusion of hydrogen is 24.7 MeV , then the ratio $\frac{E_2}{E_1}$ is

- A. 2
- B. 7
- C. 10
- D. 20

Answer: B



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26. A particle executing S.H.M. having amplitude 0.01 m and frequency 60 Hz. Determine maximum acceleration of particle.

A. $144\pi^2 m / s^2$

B. $120\pi^2 m / s^2$

C. $80\pi^2 m / s^2$

D. $60\pi^2 m / s^2$

Answer: A



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27. The graph between the length and square of the period of a simple pendulum is a

- A. elliptical
- B. hyperbola
- C. parabola
- D. circular

Answer: C



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28. Threshold wavelength for photoelectric effect on sodium is 5000\AA . Its work function is

A. 7.5 eV

B. 2.5 eV

C. 10 eV

D. 5.0 eV

Answer: B



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29. According to Einstein's photoelectric equation, the plot of the K.E. of the emitted photoelectrons from a metal vs the frequency of incident radiation gives a straight line where slope

A. Depends on the nature of the metal used

B. Depends on the intensity of the radiation

C. Depends both on the intensity of the radiation and the metal used

D. Is the same for all metals and independent of the intensity of the radiation

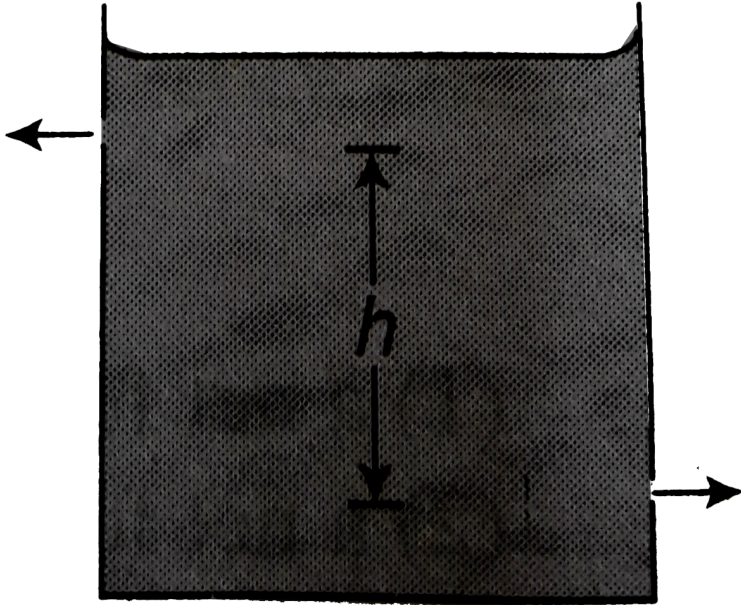
Answer: D



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30. There are two identical small holes on the opposite sides of a tank containing a liquid. The tank is open at the top. The difference in height between the two holes is h . As the liquid comes out of the two holes. The tank will experience a net horizontal force

proportional to.



A. $h^{1/2}$

B. h

C. $h^{3/2}$

D. h^2

Answer: B



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31. A body of density d is counterpoised by Mg of weights of density d_1 in air of density d . Then the true mass of the body is

A. M

B. $M \left(1 - \frac{d}{d_2} \right)$

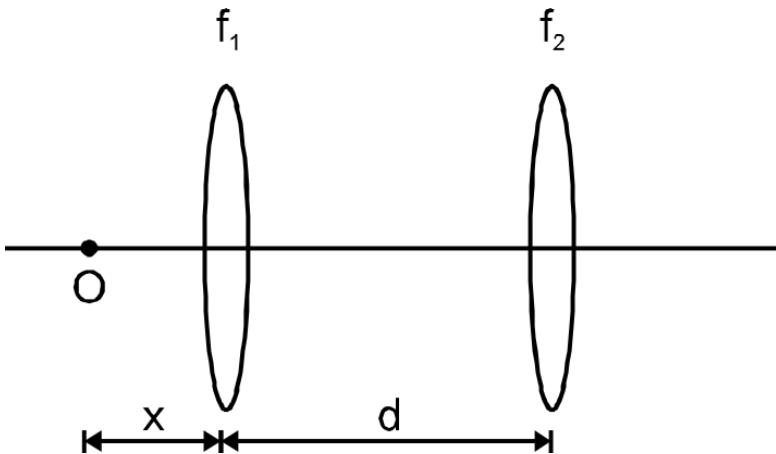
C. $M \left(1 - \frac{d}{d_1} \right)$

$$D. M \left(\frac{1 - \frac{d}{d_2}}{1 - \frac{d}{d_1}} \right)$$

Answer: D



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32.

Two converging lenses have focal length f_1 and f_2 ($f_1 > f_2$). The optical axis of the

two lenses coincide. This lens system is used to form an image of a real object. It is observed that the final magnification of the image does not depend on the distance x . The whole arrangement is shown in figure. The final magnification is :

A. $\frac{f_1 f_2}{f_1 + f_2}$

B. $f_1 + f_2$

C. $|f_1 - f_2|$

D. $\frac{(f_1 - f_2)^2}{f_1}$

Answer: B





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33. The refractive index of water is 1.33. What will be the speed of light in water

A. $3 \times 10^8 \text{ms}^{-1}$

B. $4 \times 10^8 \text{ms}^{-1}$

C. $1.33 \times 10^8 \text{ms}^{-1}$

D. $2.26 \times 10^8 \text{ms}^{-1}$

Answer: D



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34. A ring of radius R rolls without slipping on a rough horizontal surface with a constant velocity. The radius of curvature of the path followed by any particle of the ring at the highest point of its path will be :



.

A. 5 R

B. 2 R

C. 4 R

D. None of these

Answer: C



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35. For the same total mass, which of the following will have the largest moment of inertia about an axis passing through the

centre of mass and perpendicular to the plane
of the body

A. A disc of radius a

B. A ring of radius a

C. A square lamina of side $2a$

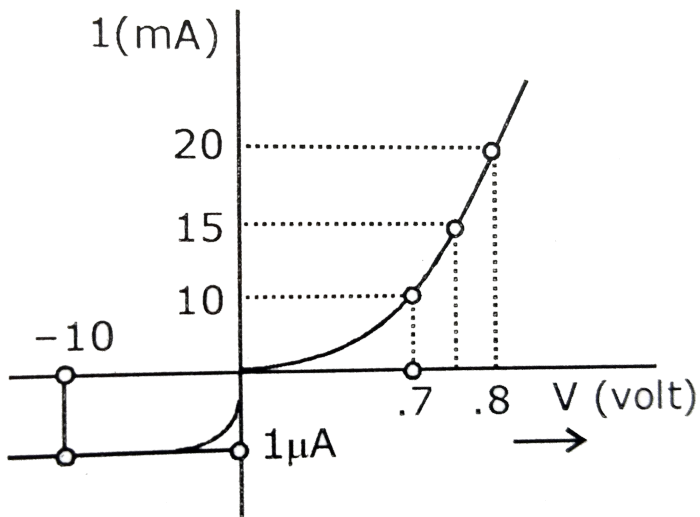
D. Four rods forming a square of side $2a$

Answer: D



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36. The V-I characteristic of a diode is shown in the figure. The ratio of forward to reverse bias resistance is



A. 10

B. 10^{-6}

C. 10^6

D. 100

Answer: B



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37. In a CE transistor amplifier, the audio signal voltage across the collector resistance of $2k\Omega$ is $2V$. If the base resistance is $1k\Omega$ and the current amplification of the transistor is 100, the input signal voltage is:

A. 1 mV

B. 10 mV

C. 0.1 V

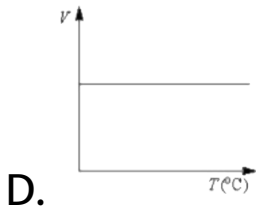
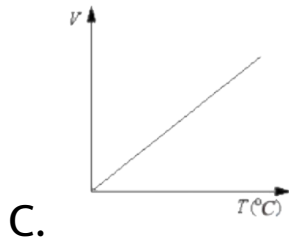
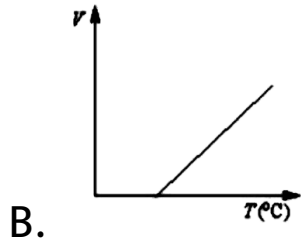
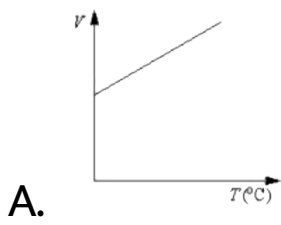
D. 1 V

Answer: B



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38. Volume-temperature graph at atmospheric pressure for a monoatomic gas (V in m^3 , T in $^{\circ}C$) is



Answer: B



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39. When the voltage and current in a conductor are measured as $(100 \pm 4)V$ and $(5 \pm 0.2) A$, then the percentage of error in the calculation of resistance is

A. 8 %

B. 4 %

C. 20 %

D. 10 %

Answer: A



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40. The distance between two coherent sources is 1 mm. The screen is placed at a distance of 1 m from the sources. If the distance of the third bright fringe is 1.2 mm from the central fringe, the wavelength of light used is

A. 4000\AA

B. 5000\AA

C. 6000\AA

D. 7200\AA

Answer: A



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41. How will the diffraction pattern of single slit change when yellow light is replaced by blue light? The fringe will be

A. Darker

B. Brighter

C. Wider

D. Narrower

Answer: D



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42. When the length of the vibrating segment of a

sonometer wire is increased by 1% the

percentage

change in its frequency is

A. $\frac{100}{101}$

B. $\frac{99}{100}$

C. 1

D. 2

Answer: C



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43. With the propagation of a longitudinal wave through a material medium, the quantities transmitted in the propagation direction are

A. energy , momentum and mass

B. energy

C. energy and mass

D. energy and linear momentum

Answer: B



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44. A pump motor is used to deliver water at a certain rate from a given pipe. To obtain 'n' times water from the same pipe in the same time, by what amount the power of the motor should be increased?

A. $n^{1/2}$

B. n^2

C. n^3

D. n

Answer: C



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45. A block of mass 2 kg is kept at origin at $t = 0$ and is having velocity $4\sqrt{5}m/s$ in positive x -direction. The only force on it is a conservative and its potential energy is defined as $U = -x^3 + 6x^2 + 15$ (SI units). Its velocity when the force acting on it is minimum (after the time $t = 0$) is

A. 8 m/s

B. 4 m/s

C. $10\sqrt{24}m / s$

D. $20m / s$

Answer: A



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