PHYSICS

BOOKS - NTA MOCK TESTS

NTA NEET SET 68

Physics

1. An electron collides with a hydrogen atom in its ground state and excites it to $n = 3$,. The energy gives to hydrogen aton n this inclastic collision is [Neglect the recoiling of hydrogen atom]

A. 10.2 eV

B. 12.1 eV

C. 12.5 eV

D. None of these

Answer: B

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2. At what speed should the electron revolve around the nucleus of a hydrogen atom in order that it may not be pulled into the nucleus by electrostatic attraction ? Take the radius of orbit of an electron as 0.5Å , the mass of the electron as 9.1×10^{-31} kg and charge as $1.6 \times 10^{-19} C$.

A. $2.25 \times 10^{4} ms^{-1}$

B. $2.25 \times 10^{5} ms^{-1}$

C. $2.25 \times 10^6 ms^{-1}$

D. $2.25 \times 10^7 ms^{-1}$

Answer: C

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3. Three identical spheres of mass M each are placed at the corners of an equilateral triangle of side 2 m. Taking one of the corners as the origin, the position vector of the centre of mass is

A. $\sqrt{3}\left(\hat{i}-\hat{j}\right)$

B. $\sqrt{3}\left(\hat{i}-\hat{j}\right)$

C. $\frac{\hat{i}}{\sqrt{3}}+\hat{j}$

D. $\frac{\hat{i}+\hat{j}}{3}$

Answer: D

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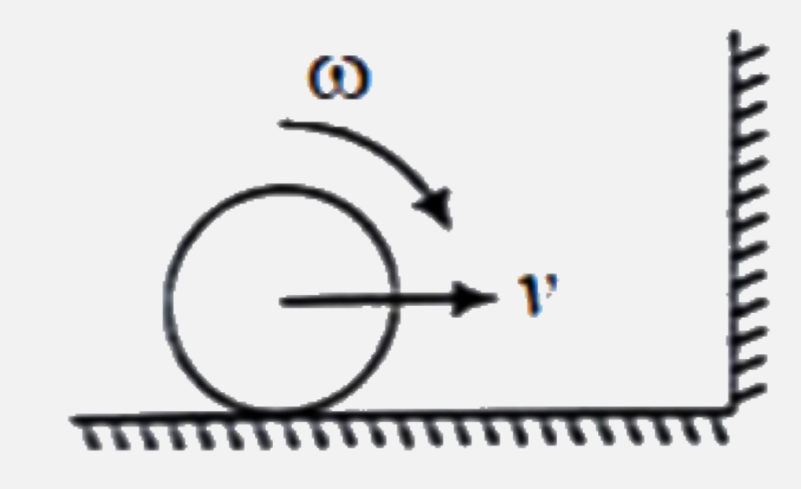
4. A ball having velocity v towards the right and having angular velocity clockwise approaches the wall. It collides elastically with wall and moves towards the left . Ground and wall are frictionless. Select the correct statement about the

angular velocity of the ball after the collision .



A. It will be anti - clockwise

B. It becomes zero

C. Angular speed decreases

D. It will be clockwise

Answer: D

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5. A sphere is suspended by a thread of length l. What minimum horizontal velocity has to be imparted the ball for it to reach the height of the suspension?

A. $2\sqrt{gl}$

B. $\sqrt{2gl}$

C. $\sqrt{gl}$

D. $4\sqrt{gl}$

Answer: B

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6. A flywheel at rest is to reach an angular velocity of 24 rad/s in 8 second with constant angular acceleration. The total angle turned through during this interval is

A. 24 rad

B. 48 rad

C. 72 rad

D. 96 rad

Answer: D

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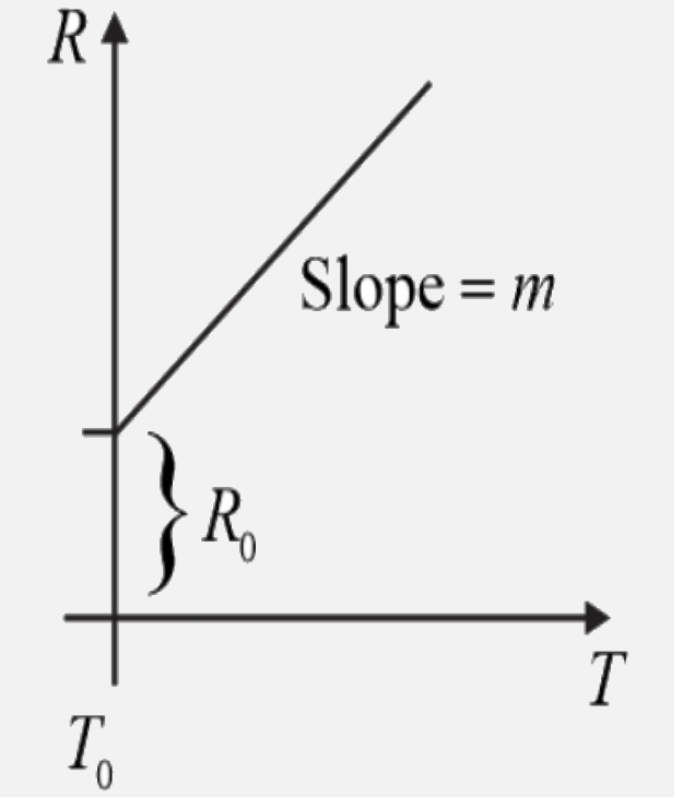
7. Variation of resistance of the conductor with temperature is shown . Temperature coefficient of the conductor is



A. $\frac{R_0}{m}$

B. mR_0

C. m^2R_0

D. $\frac{m}{R_0}$

Answer: D

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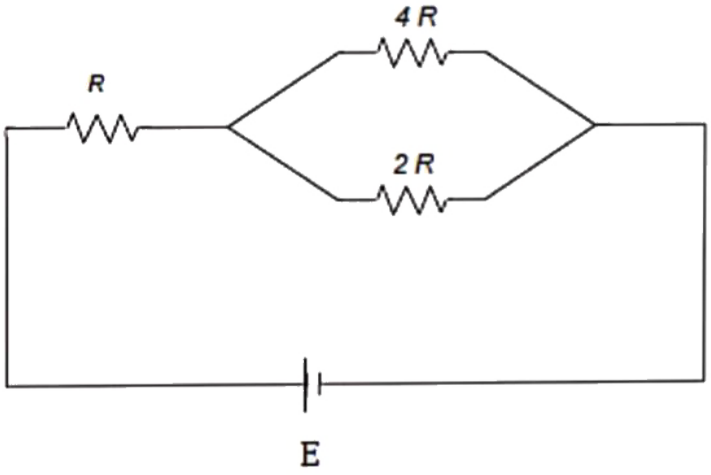
8. The figure shows a network in which the cell is deal and it has an emf E. The potential difference across the resistance 2R is



A. 2E

B. $\frac{4E}{7}$

C. $\frac{E}{7}$

D. $\frac{3E}{7}$

Answer: B

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9. The magnetic flux near the axis and inside the air core solenoid of length $60cm$ carrying current 'f' is $1.57 \times 10^{-6}Wb$. Its magnetic moment will be (cross-sectional area of a solenoid is very small as compared to its length.

$\mu_0 = 4\pi \times 10^{-7}$SI unit)

A. $0.25Am^2$

B. $0.5Am^2$

C. $0.75Am^2$

D. $1Am^2$

Answer: C

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10. Power dissipated in an $L-C-R$ series circuit connected to an AC source of emf ε is

A. $\frac{\varepsilon^2\sqrt{R^2+\left(L\omega-\frac{1}{C\omega}\right)}}{R}$

B. $\frac{\varepsilon^2\left[R^2+\left(L\omega-\frac{1}{C\omega}\right)^2\right]}{R}$

C. $\frac{\varepsilon^2 R}{\sqrt{R^2+\left(L\omega-\frac{1}{C\omega}\right)^2}}$

D. $\frac{\varepsilon^2 R}{\left[R^2+\left(L\omega-\frac{1}{C\omega}\right)^2\right]}$

Answer: D

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11. Electrical force between two point charge is $200N$, if we increase $10\,\%$ charge on one of the charge and and decrease $10\,\%$ charge on other then electrical force between them for the same direction becomes.

A. 200 N

B. 202 N

C. 198 N

D. 199 N

Answer: C

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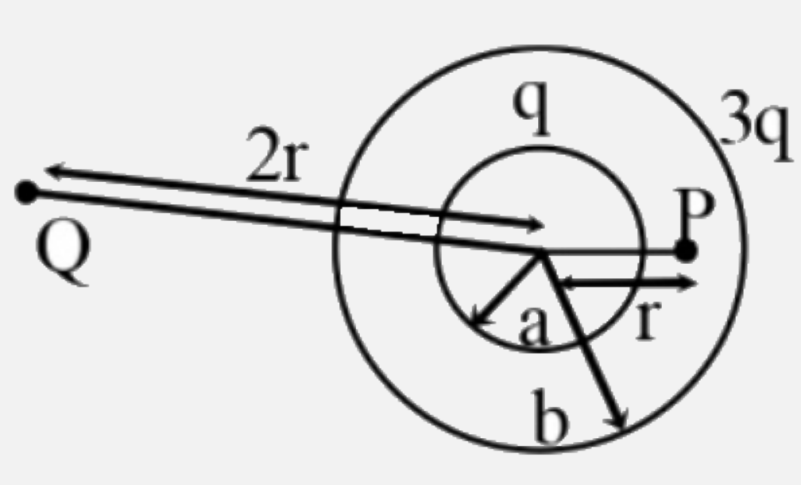
12. The ratio of electric field intensity at P & Q in the shown arrangement is



A. $1:2$

B. $2:1$

C. $1:1$

D. $4:3$

Answer: C

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13. Keller's third law states that the square of period of revolution (T) of a planet around the sun is proportional to the sun is proportional to the third power of average distance , r between the sun and the planet i.e $T^2 = Kr^3$ Here ,K is constant . If masses of the sun and the planet are M and m respectively , then as per Newton's law of gravitation force of attraction between them is $F = \frac{GMm}{r^2}$, Where G is gravitational constant . The relation between G and K is described as

A. $GK = 4\pi^2$

B. $GMK = 4\pi^2$

C. $K = G$

D. $K = \frac{1}{G}$

Answer: B

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14. The acceleration due to gravity on the surface of a planet is one - fourth of the value on Earth. When a brass ball is brought to this planet , its

A. Mass is halved

B. Weight is halved

C. Mass becomes one - fourth

D. Weight becomes one - fourth

Answer: D

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15. If the emission rate of a blackbody at $0^\circ C$ is R , then the rate of emission at $273^\circ C$ is

A. 2R

B. 4R

C. 8R

D. 16R

Answer: D

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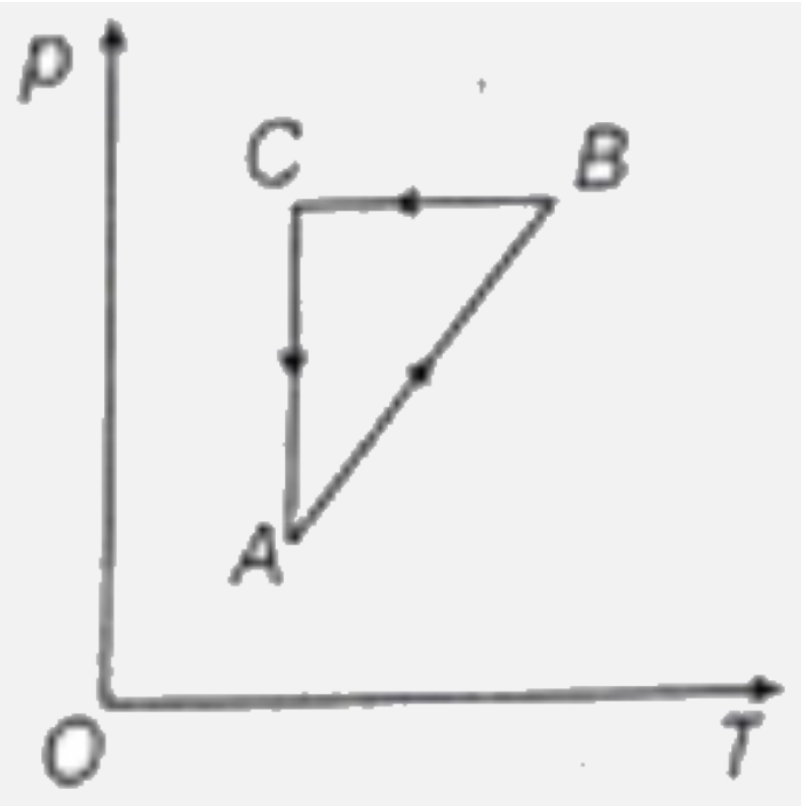
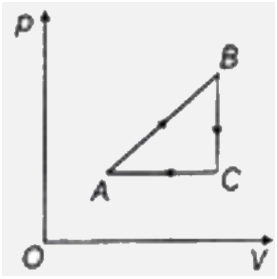
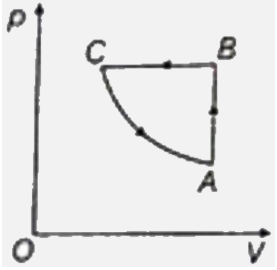
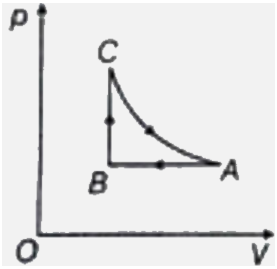
16. A cyclic process is shown in the p – T diagram . Which of the following curves shows the same process on the p – V

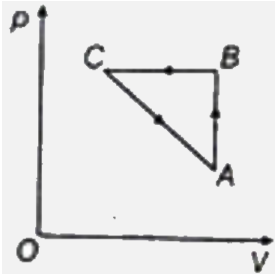
diagram ?



A. 

B. 

C. 

D. 

Answer: B

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17. An ideal gas is taken through a cyclic thermodynamical process through four steps. The amounts of heat involved in these steps are $Q_1 = 5960J, Q_2 = -5585J, Q_3 =$ and $-2980JQ_4 = 3645J,$ respectively . The corresponding works involved are $W_1 = 2200J, W_2 = -825J, W_3 =$ and $-1100JW_4$ respectively. The value of W_4 is

A. 1315 J

B. 275 J

C. 765 J

D. 675 J

Answer: C

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18. Ions of different momentum (p), having the same charge, enter normally a uniform magnetic field. The radius of the orbit of an ion is proportional to

A. P

B. $\frac{1}{p}$

C. P^2

D. $\frac{1}{p^2}$

Answer: A

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19. A galvanometer of resistance 50Ω given full-scale deflection for a current of 10 mA is to be changed into a voltmeter of

rang 100 V . What should be the Value of resistance to be added in series with this galvanometer ?

A. 9950Ω

B. 10025Ω

C. 10000Ω

D. 9975Ω

Answer: A

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20. Nickel shows ferromagnetic property at room temperature. If the temperature is increased beyond curie temperature, then it will show

A. Anti ferromagnetism

B. No magnetic property

C. Diamagnetism

D. Paramagnetis

Answer: D

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21. The position coordinates of a particle moving in X - Y as a function of time t are $x = 2t^2 + 6t + 25$

$y = t^2 + 2t + 1$

The speed of the object at t = 10 s is approximately

A. 31 units

B. 51 units

C. 71 units

D. 81 units

Answer: B

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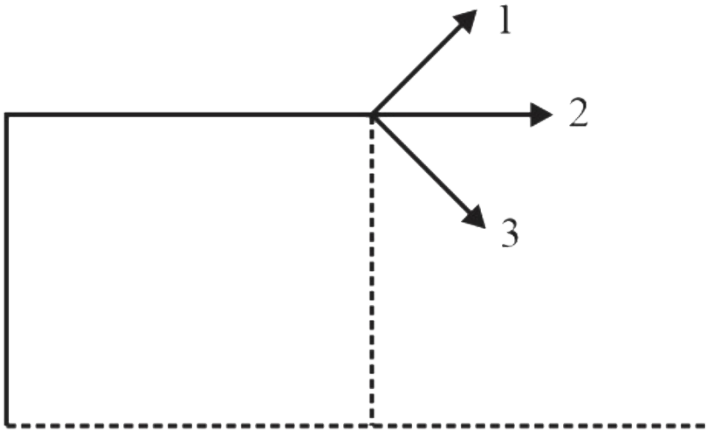
22. Three balls are dropped from the top of a building with equal speeds but at different angles. Balls strike the ground with velocities v_1, v_2 and v_3 respectively, then



A. $v_1 > v_2 > v_3$

B. $v_3 > v_2 > v_1$

C. $v_3 = v_2 = v_1$

D. $v_2 < v_3 < v_1$

Answer: C

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23. A man of $50kg$ is standing at one end on a boat of length $25m$ and mass $200kg$.If he starts running and when he reaches the other end, has a velocity $2ms^{-1}$ with respect to the boat.The final velocity of the boat is

A. $\frac{2}{5}$

B. $\frac{2}{3}$

C. $\frac{8}{5}$

D. $\frac{8}{3}$

Answer: A

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24. A piece of wire is bent in the shape of a parabola $y = kx^2$ (y-axis vertical) with a bead of mass m on it. The bead can slide on the wire without friction. It stays at the lowest point of the parabola when the wire is at rest. The wire is now accelerated parallel to the x-axis with a constant acceleration a. The distance of the new equilibrium position of the bead, where the bead can stay at rest with respect to the wire, from the y-axis is:

A. a/gk

B. a/2gk

C. 2a/gk

D. a/4gk

Answer: B

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25. The curve of blinding energy per nucleon as a function of atomic mass number has a sharp peak for helium nucleus. This implies that helium.

A. Can easily be broken up

B. Is very stable

C. Can be used as fissionable material

D. Is radioactive

Answer: B

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26. Select the true statement from the following Nuclear force is

A. Strong , short range and charge independent force.

B. charge independent , attractive and long range force.

C. Strong , charge dependent and short range attractive force

D. Long range , charge dependent and attractive force.

Answer: A

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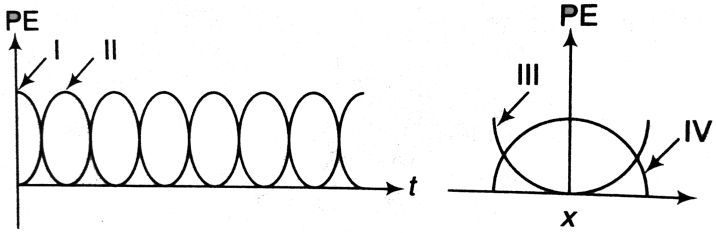
27. For a particle executing SHM, the displacement x is given by $x = A\cos\omega t$. Identify the graph which represents the variation of potential energy (PE) as a function of time t and displacement x.



(a) I, III

(b) II, IV (c) II, III

(d) I, IV

A. I,III

B. II,IV

C. II,III

D. I,IV

Answer: A

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28. A simple pendulum suspended from the ceiling of a trans has a time period T when the train is at rest. If the train is accelerating uniformly at a then its time period

A. increase

B. decrease

C. remain unaffected

D. become infinite

Answer: B

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29. Two photons of same frequencies moving in same medium have

A. Same linear momentum and same wavelengths

B. Same linear momentum and same speeds

C. Same energies and same linear momentum

D. None of these

Answer: D

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30. If the kinetic energy of a moving particle is E , then the de-Broglie wavelength is

A. $\lambda = h\sqrt{2mE}$

B. $\lambda = \sqrt{\frac{2mE}{h}}$

C. $\lambda = \frac{h}{\sqrt{2mE}}$

D. $\lambda = \frac{hE}{\sqrt{2mE}}$

Answer: C

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31. In a capillary tube having area of cross - section A, water rises to a height h. If cross-sectional area is reduced to $\frac{A}{9}$, the rise of water in the capillary tube is

A. 4h

B. 3h

C. 2h

D. h

Answer: B

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32. Two bodies are in equilibrium when suspended in water from the arms of balance. The mass of one body is 36 g and its

density is $9g/cm^3$ If the mass of the other is 46 g, its density in g/cm^3 is

A. $\frac{4}{3}$

B. $\frac{3}{2}$

C. 3

D. 5

Answer: C

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33. A ray of light is incident on a surface of glass slab at an angle 45°. If the lateral shift produced per unit thickness is $1/\sqrt{3}$, the angle of refraction produced is

A. $\tan^{-1}\left(\frac{\sqrt{3}}{2}\right)$

B. $\tan^{-1}\left(1-\sqrt{\frac{2}{3}}\right)$

C. $\sin^{-1}\left(1-\sqrt{\frac{2}{3}}\right)$

D. $\tan^{-1}\left(\sqrt{\frac{2}{3-1}}\right)$

Answer: B

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34. Monochromatice light is refracted from air into glass of refractive index μ. The ratio of the wavelength of the incident and refracted waves in

A. $1:1$

B. $1:\mu$

C. $\mu : 1$

D. $\mu^2 : 1$

Answer: C

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35. An ice skater spins at $3\pi \ \mathrm{rad\,s^{-1}}$ with hers arms extended. If her moment of inertia with arms folded is $75\ \%$ of that with arms extended, her angular velocity when she fold her arms is

A. $\pi rads^{-1}$

B. $2\pi rads^{-1}$

C. $3\pi rads^{-1}$

D. $4\pi rads^{-1}$

Answer: D

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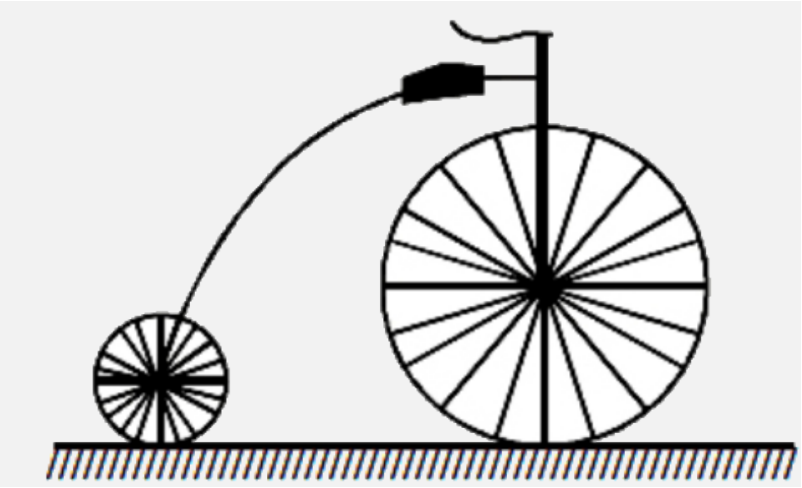
36. The wheels on the old-time bicycle shown in diagram have radii of 60.0 cm and 10.0 cm If the larger wheel is rotating at $12.0 rads^{-1}$ What is the angular speed of the smaller wheel ?



A. $12.0 rads^{-1}$

B. $60.0 rads^{-1}$

C. $72.0 rads^{-1}$

D. $2.0 rads^{-1}$

Answer: C

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37. The input signal is given to a CE amplifier having a voltage gain of 150 is $V_i = 2\cos\left(15t + \frac{\pi}{3}\right)$ The corresponding output signal will be :

A. $75\cos\left(15t + \frac{2\pi}{3}\right)$

B. $2\cos\left(15t + \frac{5\pi}{6}\right)$

C. $300\cos\left(15t + \frac{4\pi}{3}\right)$

D. $300\cos\left(15t + \frac{\pi}{3}\right)$

Answer: C

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38. What will be the input of A and B for the Boolean expression $\overline{(A+B)}.\overline{(A.B)}=1$?

A. (0,0)

B. (0,1)

C. (1,0)

D. (1,1)

Answer: A

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39. Liquids A and B are at 30° C and 20° C, respectively. When mixed in equal masses,the temperature of the mixture is found to be 26° C, The specific heats of A and B are in the ratio of $m:n$, where m and n are integers, then find minimum value of $m+n$.

A. 5

B. 2

C. 6

D. 7

Answer: A

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40. The set of physical quantities among the following which is dimensionally different is

A. Terminal velocity , drifty , drift velocity , critical velocity

B. Potential energy , work done, kinetic energy

C. Disintegration constant , frequency angular velocity

D. Dipole moment , electric flux , electric field

Answer: D

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41. In young's double-slit experiment , the spacing between the slits is 'd' and the wavelength of light used is 6000Å If the

angular width of a fringe formed on a distance screen is 1° then calculate 'd' .

A. 1 mm

B. 0.05 mm

C. 0.03 mm

D. 0.01 mm

Answer: C

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42. In Young's double slit experiment the source is white light. One slit is covered with red filter and the other with blue filter. There shal be

A. Alternate red and blue fringes

B. Alternate dark and pink fringes

C. Alternate dark and yellow fringes

D. No interference

Answer: D

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43. A wave pulse in a string is described by the equation $y_1 = \frac{5}{(3x - 4t)^2 + 2}$ and another wave pulse in the same string is described by .. The values of $y_2 = \frac{-5}{(3x + 4t - 6)^2 + 2}$ and x are in metres and t is in seconds. Which of the following statements is correct ?

A. y_1 travels along -x - direction and y_2 along + x - direction

B. Both y_1 and y_2 travel along +x - direction

C. At $x = 1m$, y_1 and y_2 always cancel

D. At time t = 1s, y_1 and y_2 exactly cancel everywhere

Answer: C

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44. A simple wave motion represented by $y = 5\left(\sin 4\pi t + \sqrt{3}\cos 4\pi t\right)$. Its amplitude is

A. 5 units

B. $5\sqrt{3}$ units

C. $10\sqrt{3}$ units

D. 10 units

Answer: D

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45. A body of mass $3kg$ is under a constant force which causes a displacement s metre in it, given by the relation $s = \frac{1}{3}t^2$, where t is in seconds. Work done by the force in 2 seconds is

A. $\frac{8}{3}J$

B. $\frac{19}{5}$ J

C. $\frac{5}{19}$ J

D. $\frac{3}{8}$ J

Answer: A

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