PHYSICS

BOOKS - NTA MOCK TESTS

NTA NEET SET 67

Physics

1. The $K_\alpha X$-ray emission line of tungsten occurs at $\lambda = 0.021nm$. The energy difference

between K and L levels in this aotm is about :

$0.51 MeV$

A. 0.51 MeV

B. 1.2 MeV

C. 59 keV

D. 13.6 eV

Answer: C

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2. The binding energy per nucleon of $._3^7 Li$ and $._2^4 He$ nuclei are 5.60 MeV and 7.06 MeV respectively. In the nuclear reaction $._3^7 Li + ._1^1 H \rightarrow 2._2^4 He + Q$, the value of energy Q released is

A. 19.6 MeV

B. $-2.4 MeV$

C. 8.4 MeV

D. 17.3 MeV

Answer: D

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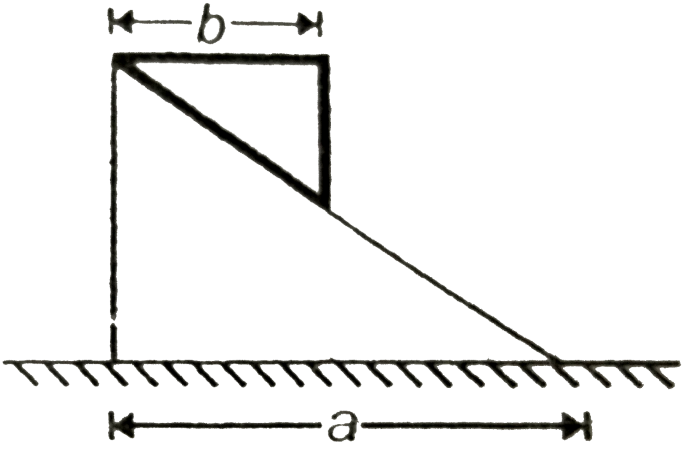
3. Two smooth prisms of similar right-triangular sections are arranged on a smooth horizontal plane as shown in figure. The lower prism has a mass η times the upper prism. The prisms are held in an initial position as shown and are then released. As the upper prism touches the horizontal plane, the distance

moved b y the lower prism is



A. $a - b$

B. $\frac{a - b}{3}$

C. $\frac{b - a}{2}$

D. $\frac{a - b}{4}$

Answer: D

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4. A girl of mass 50 kg stands on a railroad car of mass 75 kg moving with velocity $20ms^{-1}$. Now , the girl begins to run with a velocity of $10ms^{-1}$ with respect to the car in the same direction , as that of the car. The velocity of the car at this instant will be

A. $20ms^{-1}$

B. $24ms^{-1}$

C. $16ms^{-1}$

D. $18ms^{-1}$

Answer: C

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5. A car round on unbanked curve of radius 92 m without skidding at a speed of $26ms^{-1}$. The smallest possible coefficient of static friction between the tyres and the road is

A. 0.75

B. 0.60

C. 0.45

D. 0.30

Answer: A

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6. A particle travels along the arc of a circle of radius r. Its speed depends on the distance travelled l as $v = a\sqrt{l}$ where 'a' is a constant.

The angle α between the vectors of net acceleration and the velocity of the particle is

A. $\alpha = \tan^{-1}\left(\frac{2l}{r}\right)$

B. $\alpha = \cos^{-1}\left(\frac{2l}{r}\right)$

C. $\alpha = \sin^{-1}\left(\frac{2l}{r}\right)$

D. $\alpha = \cot^{-1}\left(\frac{2l}{r}\right)$

Answer: A

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7. An ammeter and a voltmeter of resistance R are connected in series to an electric cell of negligible internal resistance . Their readings are A and V respectively. If another resistance R is connected in parallel with the voltmeter , then

A. Both A and V will increase

B. Both A and V will decrease

C. A will decrease and V will increase

D. A will increase and V will decrease

Answer: D

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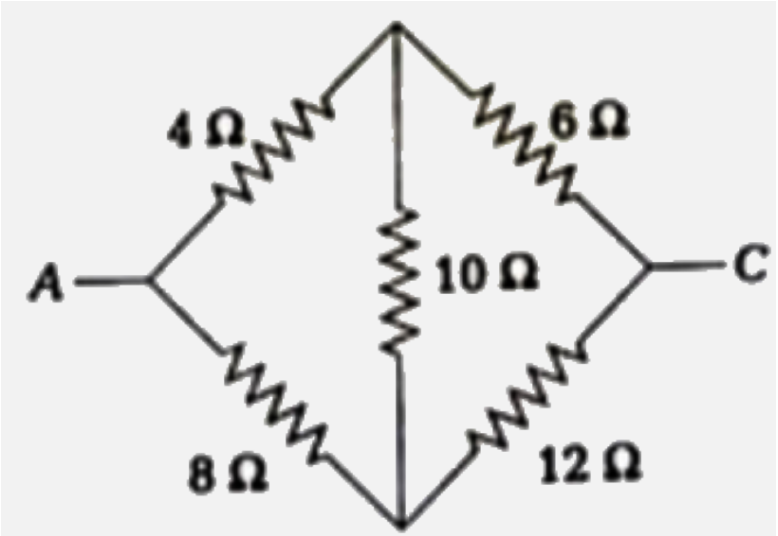
8. Five resistance are connected as shown in the figure. The equivalent resistance between points A and C is



A. 44Ω

B. $\frac{20}{3}\Omega$

C. 212Ω

D. 30Ω

Answer: B

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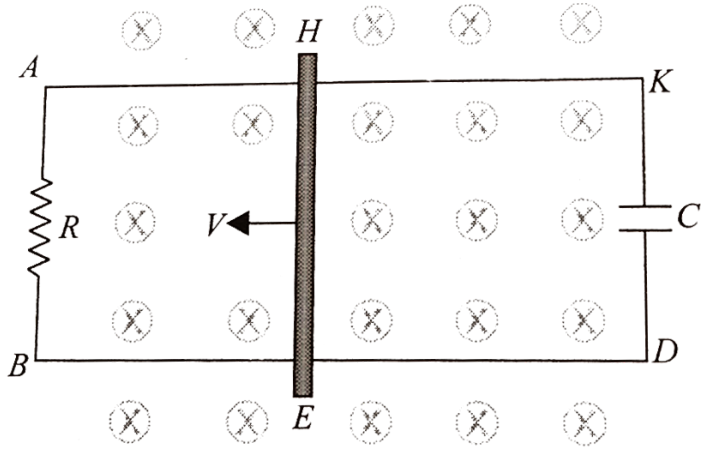
9. In the circuit shown in Fig. A conducting wire HE is moved with a constant speed v towards left. The complete circuit is placed in

a uniform magnetic field $\overrightarrow{B}$ perpendicular to the plane of circuit inwards. The current in HKDE is



A. Clockwise

B. Anticlockwise

C. Alternating

D. Zero

Answer: D

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10. A metal disc of radius 200 cm is rotated at a constant angular speed of $60 rads^{-1}$ in a plane at right angles to an external field of magnetic induction $0.05 Wbm^{-2}$. Find the e.m.f. induced between the centre and a point on the rim.

A. 3V

B. 1.5 V

C. 6V

D. 9V

Answer: B

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11. Two similar point charges q_1 and q_2 are placed at a distance r apart in the air. The force between them is F_1 . A dielectric slab of thickness $t(<r)$ and dielectric constant K is

placed between the charges . Then the force between the same charge . Then the fore between the same charges is F_2 . The ratio is

A. 1

B. K

C. $\left[\frac{r-t+t\sqrt{K}}{r}\right]^2$

D. $\left[\frac{r}{r-t+t\sqrt{K}}\right]^2$

Answer: C

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12. Two identical conducting sphere carrying different charges attract each other with a force F when placed in air medium at a distance d apart. The spheres are brought into contact and then taken to their original positions. Now, the two sphere repel each other with a force whole magnitude is equal to the initial attractive force. The ratio between initial charges on the spheres is

A. $-\left(3+\sqrt{8}\right)$ only

B. $-3+\sqrt{8} only$

C. $-\left(3+\sqrt{8}\right)$ or $\left(-3+\sqrt{8}\right)$

D. $-\sqrt{8}$

Answer: C

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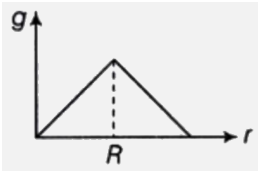
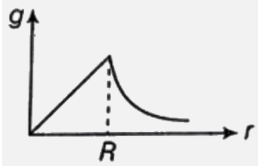
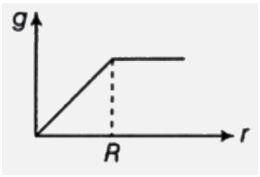
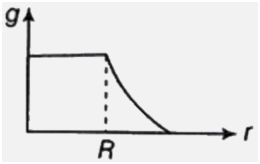
13. Which of the following graphs correctly represents the variation of g on the - Earth?

A. 

B. 

C. 

D. 

Answer: B

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14. Consider that the Earth is revolving around the Sun in a circular orbit with a period T. The

area of the circular orbit is directly proportional to

A. $T^{2/3}$

B. $T^{1/3}$

C. $T^{4/3}$

D. $T^{1/2}$

Answer: C

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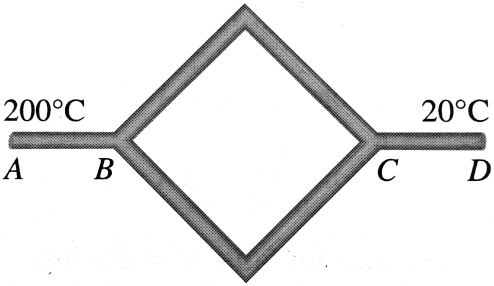

15.

Six identical cunducting rods are joined as shown in Fig. Points A and D are maintained at temperatures $200^\circ C$ and $20^\circ C$ respectively. The temperature of junction B will be

A. $120^\circ C$

B. $100^\circ C$

C. $140^\circ C$

D. $80^\circ C$

Answer: C

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16. when an ideal gas with pressure p and volume V is compressed Isothermally to one - fourth of its volume, is pressure is P_1 when

the same gas is compressed polytropically according to the equation $PV^{1.5}$ contents to one - fourth of its initial volume, the pressure is P_2 the ratio $\frac{P_1}{P_2}$ is

A. $\frac{1}{2}$

B. $\frac{1}{2^{1.5}}$

C. 2

D. $2^{1.5}$

Answer: A

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17. A given quantity of a ideal gas is at pressure P and absolute temperature T. The isothermal bulk modulus of the gas is

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

B. P

C. $\frac{3}{2}P$

D. $2P$

Answer: B

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18. We have a galvanometer of resistance 25Ω. It is shunted by a 2.5Ω wire. The part of total current that flows through the galvanometer is given as

A. $\left(\frac{i}{i_0}\right) = \frac{1}{11}$

B. $\left(\frac{i}{i_0}\right) = \frac{1}{10}$

C. $\left(\frac{i}{i_0}\right) = \frac{1}{9}$

D. $\left(\frac{i}{i_0}\right) = \frac{2}{11}$

Answer: A

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19. Two long parallel wires placed 0.08 m apart, carry currents 3 A and 5 A in the same direction. what is the distance from the conductor carrying the larger current to the point where the resultant magnetic field is zero?

A. 0.5 m

B. 0.04 m

C. 0.05 m

D. 0.4m

Answer: C

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20. There are four light-weight-rod sample A, B, C, D separately suspended by threads. A bar magnet is slowly brought near each sample and the following observations are noted

(i) A is feebly repelled

(ii) B is feebly attracted

(iii) C is strongly attracted

(iv) D remains unaffected

Which one of the following is true?

A. B is a paramagnetic material

B. C is of diamagnetic material

C. D is of a ferromagnetic material

D. A is of a nonmagnetic material

Answer: A

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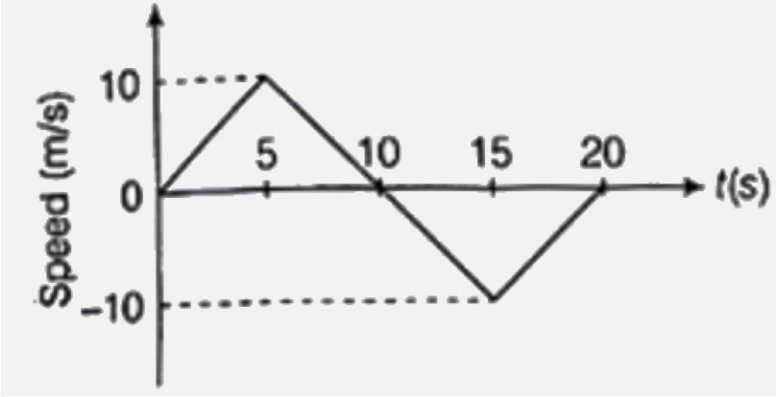
21. The one - dimensional motion of a point particle is shown in the figure. Select the correct statement



A. The total distance travelled by the particle is zero

B. The total displacement of the particle is zero

C. The maximum acceleration of the particle is $\frac{1}{2}ms^{-2}$

D. The total distance travelled by the particle at the end of 10 s is 100 m

Answer: B

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22. Distance between a frog and an insect on a horizontal plane is 10m. Frog can jump with a maximum speed of $\sqrt{10}m/s$. Minimum

number of jumps required by the frog to catch the insect is : $g = 10m/s^2$.

A. 5

B. 10

C. 100

D. 50

Answer: B

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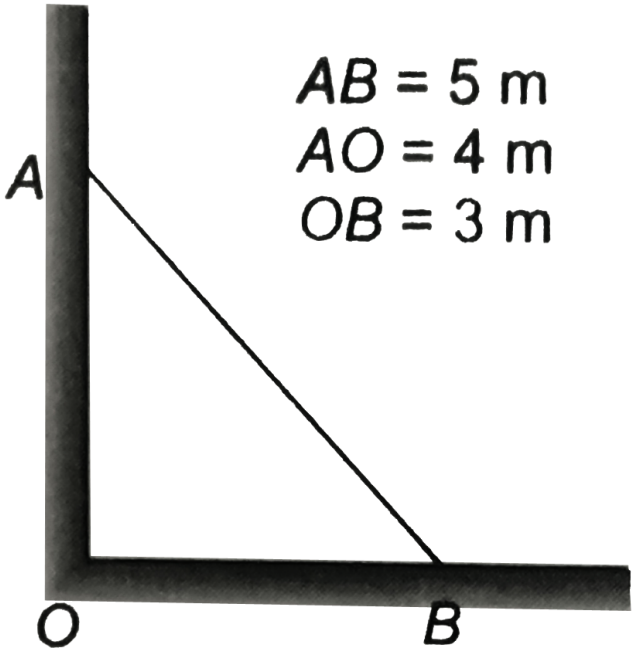
23. A ladder of length $5m$ is placed against a smooth wall as shown in figure. The coefficient or friction is μ between ladder and ground. What is the minimum value of μ , If the ladder is not to slip?



A. $\mu = 1$

B. $\mu = 0$

C. $\mu = \frac{1}{3}$

D. Impossible to balance for any value of μ

Answer: B

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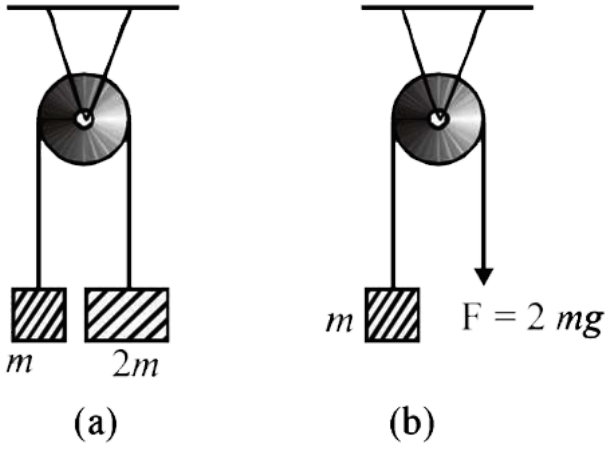
24. The pulley arrangements of Figs. (a) and (b) are identical. The mass of the rope is negligible. In (a) the mass m is lifted up by

attaching a mass 2m to the other end of the rope. In (b), m is lifted up by pulling the other end of the rope with a constant downward force $F = 2mg$. The acceleration of m is the same in both cases



A. $g/3, g/3$

B. $g/3, g$

C. $g/4, g/3$

D. $g/4, g$

Answer: B

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25. 8 kg of Cu^{66} undergones radioactive decay and after 15 minutes only 1 kg remains . The half - life , in minutes , is then

A. 5

B. 15/8

C. $8/15$

D. 15 In (2)

Answer: A

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26. In the β^+ decay process , the following changes take place inside the nucleus

A. $._Z^A X \rightarrow ._{Z-1}^A Y + e^+ + \gamma$

B. ${}_{Z}^{A}X \rightarrow {}_{Z+1}^{A}Y + e^{-} + \bar{\gamma}$

C. ${}_{Z}^{A}X \rightarrow {}_{Z}^{A}Y + e^{-} + \gamma$

D. ${}_{Z}^{A}X \rightarrow {}_{Z}^{A}Y + e^{-} + \bar{\gamma}$

Answer: A

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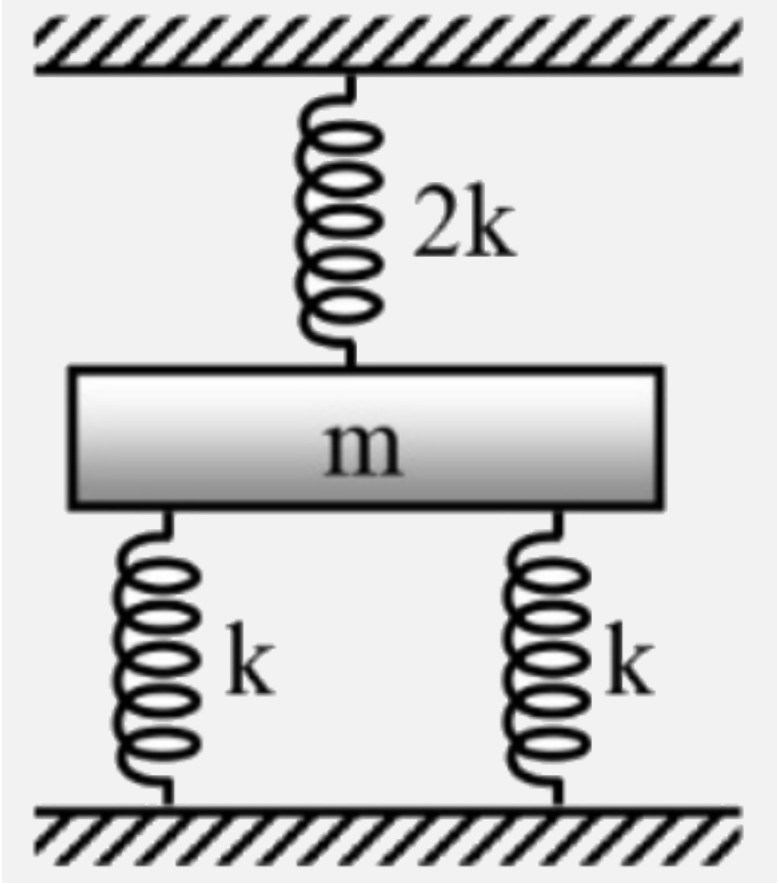
27. What is the spring constant for the combination of shown shown in figure ?



A. k

B. 2k

C. 4k

D. $\frac{5k}{2}$

Answer: C

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28. If a simple pendulum oscillates with an amplitude of 50 mm and time period of 2 sec, then its maximum velocity is

A. $0.10ms^{-1}$

B. $0.15ms^{-1}$

C. $0.8ms^{-1}$

D. $0.26ms^{-1}$

Answer: B

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29. The de-Brogile wavelength of a neutron at 927° C is λ. What will be its wavelength at 27° C?

A. 4λ

B. 2λ

C. 3λ

D. λ

Answer: B

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30. The photoeletric threshold 4v is incident on the metal is v. When light of freqency 4v is incident on the metal, the maximum kinetic energy of the emitted photoelectron is

A. 4hv

B. 3hv

C. 5hv

D. $\frac{5}{2}hv$

Answer: B

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31. If the Young's modulus of the material is 3 times its modulus of rigidity, then its volume elasticity will be

A. Zero

B. $3 \times 10^{11} Nm^{-2}$

C. infinity

D. $10.6 \times 10^{11} Nm^{-2}$

Answer: C

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32. The work done in blowing a soap bubble of 10 cm radius is (Surface tension of the soap solution is $\frac{3}{100}$ N/m)

A. $75.36 \times 10^{-4} J$

B. $37.68 \times 10^{-4} J$

C. $150.72 \times 10^{-4} J$

D. $75.36 J$

Answer: A

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33. A convex mirror forms an image one-fourth the size of the object. If object is at a distance of 0.5 m from the mirror the focal length of the mirror is

A. 0.17m

B. $-1.5m$

C. $0.4m$

D. $-0.4m$

Answer: A

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34. Light has a wavelength 600 nm in free space. it passes into the glass , which has an

index of refraction of 1.50 what is the frequency of the light inside the glass?

A. $3.3 \times 10^{14} Hz$

B. $5.0 \times 10^{14} Hz$

C. $3.3 \times 10^{5} Hz$

D. $5.0 \times 10^{5} Hz$

Answer: B

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35. A disc of the moment of inertia $'l_1'$ is rotating in horizontal plane about an axis passing through a centre and perpendicular to its plane with constant angular speed $'\omega_1'$. Another disc of moment of inertia $'I_2'$. having zero angular speed is placed discs are rotating disc. Now, both the discs are rotating with constant angular speed $'\omega_2'$. The energy lost by the initial rotating disc is

A. $\frac{1}{2}\left[\frac{I_1+I_2}{I_1I_2}\right]\omega_1^2$

B. $\frac{1}{2}\left[\frac{I_1I_2}{I_1-i_2}\right]\omega_1^2$

C. $\frac{1}{2}\left[\frac{I_1 - I_2}{I_1 I_2}\right]\omega_1^2$

D. $\frac{1}{2}\left[\frac{I_1 I_2}{I_1 + I_2}\right]\omega_1^2$

Answer: D

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36. A body is rolling down an inclined plane. If kinetic energy of rotation is $40\,\%$ of kinetic energy in translatory start then the body is a.

A. Solid cylinder

B. Solid sphere

C. Disc

D. Ring

Answer: B

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37. For a common emitter amplifier, the audio frequency voltage across the collector resistance $2k\Omega$ is 2V. If the current amplication factor of the transistor is 200, and the base

resistance is $1.5k\Omega$, the input signal voltage and base current are

A. $0.15V$ and $10\mu A$

B. $0.015V$ and $1A$

C. $0.0015V$ and $1mA$

D. $0.0075V$ and $5\mu A$

Answer: D

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38. In a system of two polarisers , it is found that the intensity of light from the second polarized is half from that of the first polariser .The angle between their pass axes is

A. 60°

B. 30°

C. 0°

D. 45°

Answer: D

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39. A gas is filled in a cylinder. its temperature is increased by 20% on the Kelvin scale and volume is reduced by 10% How much percentage of the gas has to leak for pressure to remind constant ?

A. $30\ \%$

B. $40\ \%$

C. $15\ \%$

D. $25\ \%$

Answer: D

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40. Choose the wrong statement for zero error and zero correction.

A. If the zero of the vernier scale does not coincide with the zero of the main scale then the instrument is said to be having a zero error.

B. Zero correction has a magnitude equal to zero error but sign is opposite to that of the zero error.

C. Zero error is positive when the zero of vernier scale lies to the left of the zero of the main scale.

D. Zero error is negative when the zero of vernier scale lies to the left of the zero of the main scale.

Answer: C

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41. In Young's double slit experiment, the separation between the slits is halved and the distance between the slits and the screen is doubled. The fringe width is

A. Unchanged

B. Halved

C. Doubled

D. Quadrupled

Answer: D

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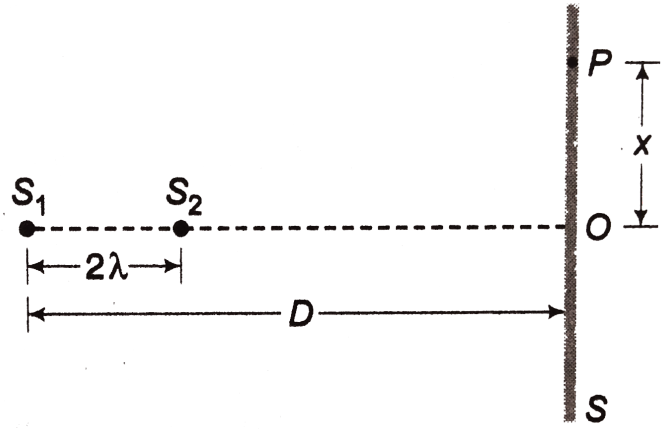
42. Two coherent narrow slits emitting light of wavelength λ in the same phase are placed parallel to each other at a small separation of 2λ. The light is collected on a screen S which is placed at a distance D($>>\lambda$) from the slit S_1 as shown in figure. Find the finite distance x such that the intensity at P is equal to

intensity O.



A. $\sqrt{2}D$

B. $\sqrt{3}D$

C. $\sqrt{8}D$

D. $\sqrt{5}D$

Answer: B

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43. Consider the vehicle emitting sound wave of frequency 700 Hz moving towards an observer at a speed $22ms^{-1}$. Assuming the observer to be at rest, and speed of sound to be $330ms^{-1}$, the frequency of sound as measured by the observer is

A. $\frac{2525}{4}Hz$

B. $\frac{1960}{3}Hz$

C. $\frac{2240}{3}Hz$

D. $750Hz$

Answer: D

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44. The electric field portion of an electromagnetic wave is given by (all variables in SI units) $E = 10^{-4}\sin\left(6 \times 10^{5}t - 0.01x\right)$ The. Frequency (f) and the speed (v) of electromagnetic wave are

A. $f = \frac{30}{\pi}kHz$ and $v = 1.5 \times 10^{7}ms^{-1}$

B. $f = \frac{90}{\pi} kHz$ and $v = 6.0 \times 10^7 ms^{-1}$

C. $f = \frac{300}{\pi} kHz$ and $v = 6.0 \times 10^7 ms^{-1}$

D. $f = \frac{600}{\pi} kHz$ and $v = 7.5 \times 10^7 ms^{-1}$

Answer: C

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45. A light and a heavy body have equal momenta. Which one has greater K.E

A. A light body

B. A heavy body

C. Both have equal kinetic energies

D. Data given is incomplete

Answer: A

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