PHYSICS

BOOKS - NTA MOCK TESTS

NTA NEET SET 60

Physics

1. if the radius of the first Bohr orbit is x, then find the de Broglie wavelength of electron in third orbit.

A. $2\pi x$

B. $6\pi x$

C. $9x$

D. $\dfrac{x}{3}$

Answer: B

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2. Constant the following two statements :

A. Liner momentum of a system of particles is

zero

B . Kinetic energy of a system of particls is zero .Then

A. I implies II and II implies I

B. I does not imply II and II does not imply I

C. I implies II but II does not imply I

D. I does not imply II but II implies I

Answer: D

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3. A wheel rotating at $12 revs^{-1}$ is brought to rest in 6 s . The average angular deceleration in rad s^{-2} of the wheel during this process is

A. 4π

B. 4

C. 72

D. π

Answer: A

4. A person travelling on a straight line moves with a uniform velocity v_1 for some time and with uniform velocity v_2 for the next equal time. The average velocity v is given by

A. $\sqrt{v_1 v_2}$

B. $\dfrac{2v_1 v_2}{v_1 + v_2}$

C. $\dfrac{v_1 + v_2}{2}$

D. $\dfrac{v_1 - v_2}{2}$

Answer: C

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5. Which of the following has the maximum resistance ?

A. Voltmeter

B. Millivoltmeter

C. Ammeter

D. Miliammeter

Answer: A

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6. An AC voltage source of variable angular frequency (ω) and fixed amplitude V_0 is connected in series with a capacitance C and an electric bulb of resistance R (inductance zero). When (ω) is increased

A. The bulb glows dimmer

B. The bulb glows brighter

C. Total impedance of the circuit is unchanged

D. Total impedance of the circuit increases

Answer: B

7. A chance Q placed at thee center of a metallic spherical shell with inner and outer radii R_1 and R_2 respectively . The normal component of the electric field at any point on the Gaussian surface with radius between R_1 and R_2 will be

A. Zero

B. $\dfrac{Q}{4\pi R_1^2}$

C. $\dfrac{Q}{4\pi R_2^2}$

D. $\dfrac{Q}{4\pi(R_1 - R_2)^2}$

Answer: A

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8. If a satellite is moving around thee earth in an orbit of 5 R radius , here R = radius of the earth . The minimum kinetic energy required to be provided to the satellite such that it

escapes the gravitational field of the earth is (M and m are masses of earth and satellite respectively)

A. $\dfrac{GMm}{5R}$

B. $\dfrac{GMm}{15R}$

C. $\dfrac{GMm}{10R}$

D. $\dfrac{GMm}{\sqrt{2}R}$

Answer: C

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9. From Kirchoff's law the ratio of emissive power and absorption power of all bodies-

A. are different

B. is equal to emissive power of black body at same temperature

C. is equal to emissive power of white body

D. is equal to emissive power of black body at any temperature

Answer: B

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10. One mole of an ideal monoatomic gas at temperature T_0 expands slowly according to the law $\dfrac{p}{V}$ = constant. If the final temperature is $2T_0$, heat supplied to the gas is

A. $2RT_0$

B. RT_0

C. $\dfrac{3}{2}RT_0$

D. $\dfrac{1}{2}RT_0$

Answer: A

11. Two particles X and Y having equal charges, after being acceleration through the same potential difference, enter a region of uniform magnetic field and describe circular paths of radii R_1 and R_2, respectively. The ratio of the mass of X to that of Y is

A. $\dfrac{r_1}{r_2}$

B. $\sqrt{\dfrac{r_1}{r_2}}$

C. $\left[\dfrac{r_2}{r_1}\right]^2$

D. $\left[\dfrac{r_1}{r_2}\right]^2$

Answer: D

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12. 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. $\dfrac{2}{5}$

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

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

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

Answer: A

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13. A 50 kg. girl wearing high heel shoes balance on a single heel. The heel is circular with a diameter 1 cm. what is the pressure exerted by the heel on the horizontal floor?

A. $6.24 \times 10^6 Pa$
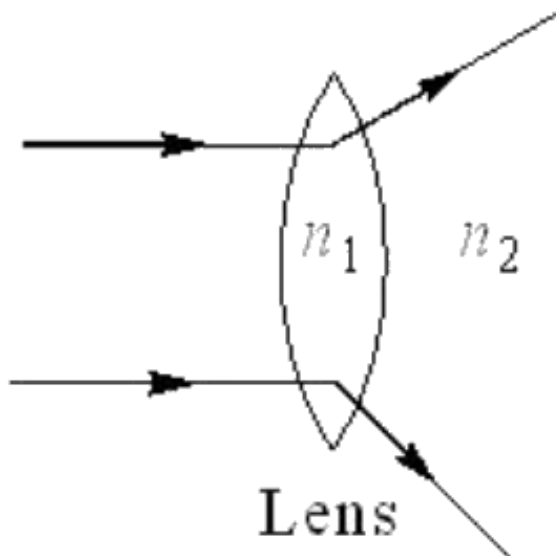
B. $5.63 \times 10^7 Pa$

C. $4.81 \times 10^6 Pa$

D. $7.19 \times 10^7 Pa$

Answer: A

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14. The relation between n_1 and n_2 if the behaviour of light ray is as shown in the figure
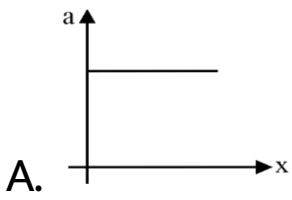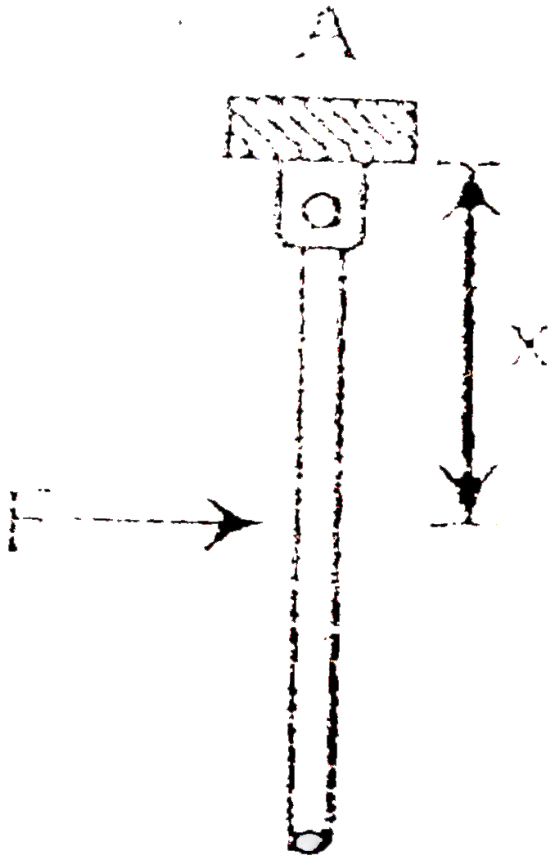

A. $n_2 > n_1$

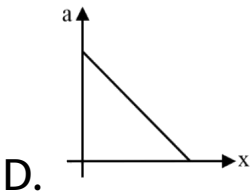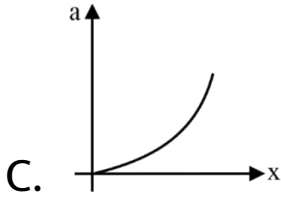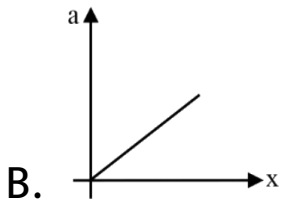B. $n_1 > > n_2$

C. $n_1 > n_2$

D. $n_1 = n_2$

Answer: A

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15. 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

A

X

F

a

x

A.

B.

C.

D.

Answer: B

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16. A motion is described by

$$Y = 4e^x \left(e^{-(5t)} \right)$$, Where y,x are in meters

and t is in second .

A. This represents progressive wave propagating along - x direction with $5ms^{-1}$

B. This represents progressive wave propagating along + x direction with $5ms^{-1}$

C. This does not represent progressive wave.

D. This represents standing wave.

Answer: B

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17. A mass M is lowered with the help of a string by a distance h at a constant acceleration $g/2$ .The work done by the string will be :

A. $\dfrac{Mgh}{2}$

B. $\dfrac{-Mgh}{2}$

C. $\dfrac{3Mgh}{2}$

D. $\dfrac{-3Mgh}{2}$

Answer: B

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18. A 500 kg car takes a round turn of radius 50 m with a velocity of 36 km/hr . The centripetal force is
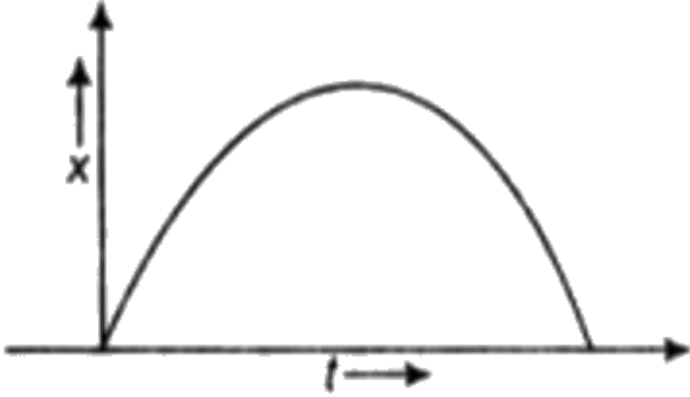
A. 250 N

B. 750 N

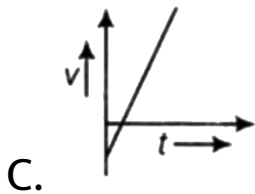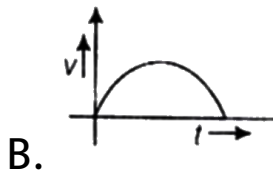C. 1000 N

D. 1200 N

Answer: C
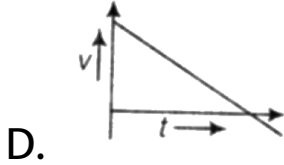
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19. The displacement -time (x– t) graph of a body is given as

The corresponding velocity -time (v – t) graph
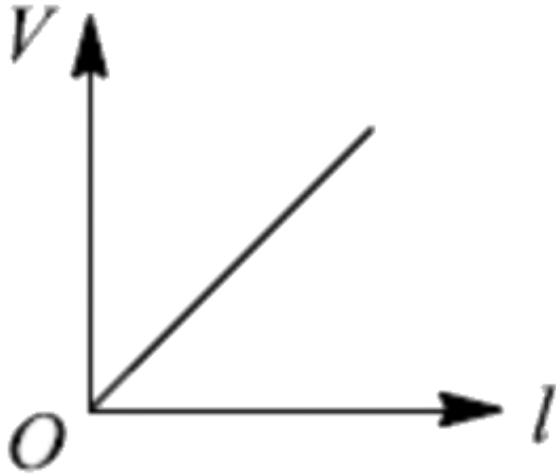
will be

A.

B.

C.

D.

Answer: D

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20. The V – I graph for a wire of copper of length L and cross -section area A is shown in the figure below . The slope of the graph will

be

A. Less if the experiment is repeated at a

higher temperature

B. More if wire of silver having the same

dimension is used

C. Doubled if the length of the wire is

   doubled

D. Doubled if the length of the wire is

   halved

Answer: C

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21. A transformer having efficiency of 90% is

working on $200V$ and $3kW$ power supply. If

the current in the secondary coil is $6A$, the

voltage across the secondary coil and current in the primary coil respectively are

A. 300 V, 15 A

B. 450 V, 15 A

C. 450 V, 13.5 A

D. 600 V, 15 A

Answer: B

22. Two equally charged small metal balls placed at a fixed distance experience a force F. A similar unchanged metal ball after touching one of them is placed at the middle point between the two balls. The force experienced by this ball is

A. $\dfrac{F}{2}$

B. F

C. 2F

D. 4F

Answer: B

23. Weight of a body of a mass m decreases by 1% when it is raised to height h above the earth's surface. If the body is taken to depth h in a mine, change in its weight is

    A. 0.5% decrease

    B. 2% , increase

    C. 0.5% increase

D. 2% decrease

Answer: A

24. Three rods of same dimensions have thermal conductivities 3K, 2k and K, with their ends at $100°C$, $50°C$ and $0°C$ respectively . They re arranged as shown in the diagram . The temperature of the junction J in steady -

state is
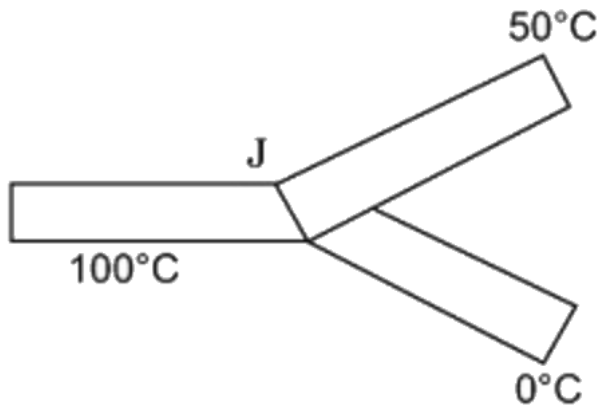
A. $\dfrac{200}{3}.^{\circ}C$

B. $\dfrac{100}{3}.^{\circ}C$

C. $75^{\circ}C$

D. $60^{\circ}C$

Answer: A

25. The cofficient of performance of a refrigerator is 5. If the temperature inside freezer is $-20°C$, the temperature of the surroundings to which it rejects heat is :

A. $41°C$

B. $11°C$

C. $21°C$

D. $31°C$

Answer: D

26. A proton is moving perpendicular to a uniform magnetic field of 2.5 tesla with 2 MeV kinetic energy. The force on proton is _____N. (Mass of proton= 1.6×10^{-27} kg, charge of proton $= 1.6 \times 10^{-19}$ C)

A. 8×10^{-12}

B. 8×10^{-11}

C. 3×10^{-11}

D. 3×10^{-10}

Answer: A

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27. A man can swim with speed $5ms^{-1}$ in still river while the river is also flowing speed $10ms^{-1}$ If the width of the river is 100 m then minimum possible drift is

A. 100 m

B. 0

C. $100\sqrt{3}m$

D. $100\sqrt{2}m$

Answer: C

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28. The quantity, when measured from different inertial reference frames, remains the same , among the following is

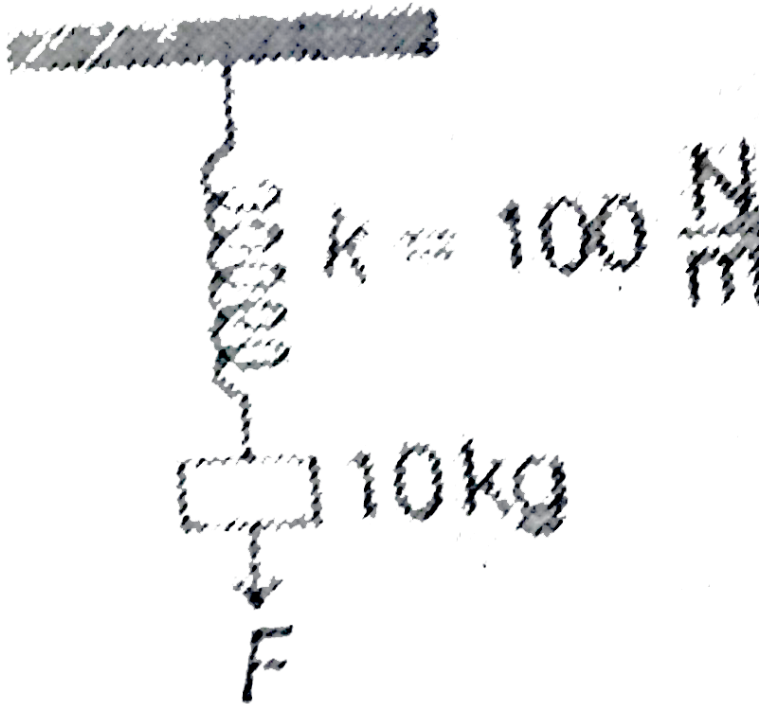A. Force

B. Velocity

C. Displacement

D. Kinetic energy

Answer: D

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29. A vertical spring of force cosntant $100N/m$ is attached with a hanging mass of 10 kg. Now an external force is applied on the

mass so that the spring is stretched by

additional 2m. The work done by the force F is

$(g = 10m/s^2)$

$k = 100 \frac{N}{m}$

10kg

F

A. 200 J

B. 400 J

C. 450 J

D. 600 J

Answer: A

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30. When a string is divided into three segments of length l_1, l_2 and l_3 the fundamental frequencies of these three segments are f_1, f_2 and f_3 respectively. The

original fundamental frequency f of the string is

A. $\sqrt{v} = \sqrt{v_1} + \sqrt{v_2} + \sqrt{v_3}$

B. $v = v_1 + v_2 + v_3$

C. $\dfrac{1}{v} = \dfrac{1}{v_1} + \dfrac{1}{v_2} + \dfrac{1}{v_3}$

D. $\dfrac{1}{\sqrt{v}} = \dfrac{1}{\sqrt{v_1}} + \dfrac{1}{\sqrt{v_2}} + \dfrac{1}{\sqrt{v_3}}$

Answer: C

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31. If the angle of minimum deviation is of 60° for an equilateral prism , then the refractive index of the material of the prism is

A. 1.41

B. 1.5

C. 1.6

D. 1.73

Answer: D

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32. A door 1.6 m wide requires a force of 1 N to be applied at the free and to open or close it. The force that is required at a point 0.4 m distant from the hinges for opening or closing the door is
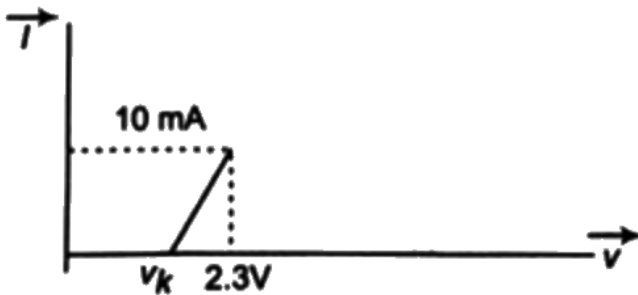
A. 1.2 N

B. 2.4 N

C. 3.6 N

D. 4 N

Answer: D

33. The resistance of a germanium junction diode, whose V –I characteristics is shown in the figure , will be $(v_k = 0.3V)$.

A. $5k\Omega$

B. $0.2k\Omega$

C. $2.3k\Omega$

D. $\left(\dfrac{10}{2.3}\right)k\Omega$

Answer: B

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34. If specific heat of a substance is infinite, it means

A. heat is given out

B. heat is taken in

C. no change in temperature whether heat

is taken in or given out

D. all of above

Answer: C

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35. The resistance $R = \dfrac{V}{I}$, where $V = (100 \pm 5.0)V$ and $I = (10 \pm 0.2)A$. Find the percentage error in R.

A. 5.2 %

B. 4.8 %

C. 7 %

D. 3 %

Answer: C

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36. The frequency of a light wave in a material is $2 \times 10^{14} Hz$ and wavelength is 5000Å. The refractive index of material will be

A. 1.40

B. 1.50

C. 3.00

D. 1.33

Answer: C

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37. Ionization energy of He^+ ion at minimum

energy position is

A. 13.6 eV

B. 27.2 eV

C. 54.4 eV

D. 68.0 eV

Answer: C

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38. 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 changed of speed

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

Answer: C

39. Select the dimensional formula of $\dfrac{B^2}{2\mu 0}$

A. $\left[M^1 L^1 T^2\right]$

B. $\left[M^{-1} L^1 T^2\right]$

C. $\left[M^{-1} L^{-1} T^{-2}\right]$

D. $\left[M^1 L^{-1} T^{-2}\right]$

Answer: D

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40. The position and velocity of a particle executing simple harmonic motion at t = 0 are given by 3 cm and $8cms^{-1}$ respectively . If the angular frequency of the particle is $2\mathrm{rad\,s}^{-1}$, then the amplitude of oscillation (in cm) is

A. 3

B. 4

C. 5

D. 6

Answer: C

41. An energy source will supply a constant current into the load if its internal resistance is

A. Equal to the resistance of the load

B. Very large as compared to the load

C. Zero

D. Non - zero but less than the resistance of the load

Answer: B

42. A body is thrown vertically up with certain initial velocity, the potential and kinetic energies of the body are equal is thrown with double the velocity upwards, the ratio of potential and kinetic energies upwards, the ratio of potential and kinetic energies of the body when it crosses the same point, is

A. $1:1$

B. $1:4$

C. $1:7$

D. $1:8$

Answer: C

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43. A photon of energy $15eV$ collides with

$H -$ atom. Due to this collision, $H -$ atom

gets ionized. The maximum kinetic energy of emitted elecrtron is:

A. 1.4 eV

B. 5 eV

C. 15 eV

D. 13.6 eV

Answer: A

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44. A wire of resistance 18Ω is divided into three equal parts. These parts are connected as sides of a triangle , the equivalent resistance of any two corners of the triangle will be

A. 18Ω

B. 9Ω

C. 6Ω

D. 4Ω

Answer: D

45. If 150 J of energy is incident on area $2m^2$. If $Q_r = 15J$, coefficient of absorption is 0.6 , then amount of energy transmitted is

A. $50J$

B. $45J$

C. $40J$

D. $30J$

Answer: B

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