



PHYSICS

BOOKS - NTA MOCK TESTS

NTA NEET SET 115

Physics

1. The energy (in eV) required to excite an electron from $n = 2$ to $n = 4$ state in hydrogen atom is

A. -0.85

B. $+4.25$

C. -3.4

D. $+2.55$

Answer: D



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2. A sample of hydrogen gas in its ground state is irradiated with photons of $10.02eV$ energies. The radiation from the above sample

is used to irradiate two other sample of excited ionized He^+ and excited ionized Li^{2+} , respectively. Both the ionized samples absorb the incident radiation.

How many spectral lines are obtained in the spectra of Li^{2+} ?

A. 10

B. 15

C. 20

D. 17

Answer: B



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3. A gun (mass= M) fires a bullet (mass= m) with speed v_r relative to barrel of the gun which is inclined at an angle of 60° with horizontal. The gun is placed over a smooth horizontal surface. Find the recoil speed of gun.

A. $V = \frac{1}{2} \frac{mV_r}{(m + M)}$

B. $V = \frac{1}{2} \frac{mV_r}{(m + M)}$

C. $V = \frac{1}{2} \frac{mV_r}{(m - M)}$

D. None of these above

Answer: A



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4. A spherical ball A of mass 4 kg, moving along a straight line strikes another spherical ball B of mass 1 kg at rest. After the collision, A and B move with velocities $v_1 \text{ m s}^{-1}$ and $v_2 \text{ m s}^{-1}$ respectively making angles of 30° and 60° with respect to the

original direction of motion of A. The ratio $\frac{v_1}{v_2}$ will be

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

B. $\frac{4}{\sqrt{3}}$

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

D. $\sqrt{3}$

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. A magnet of magnetic moment 10 Am^2 has magnetic length 5 cm. The strength of magnet is

A. 200 A m

B. 100 Am

C. 300 Am

D. 50 Am

Answer: A



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7. A $100W$ bulb is connected to an AC source of $220V$, $50Hz$. Then the current flowing through the bulb is

A. $\frac{5}{11} A$

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

C. $2A$

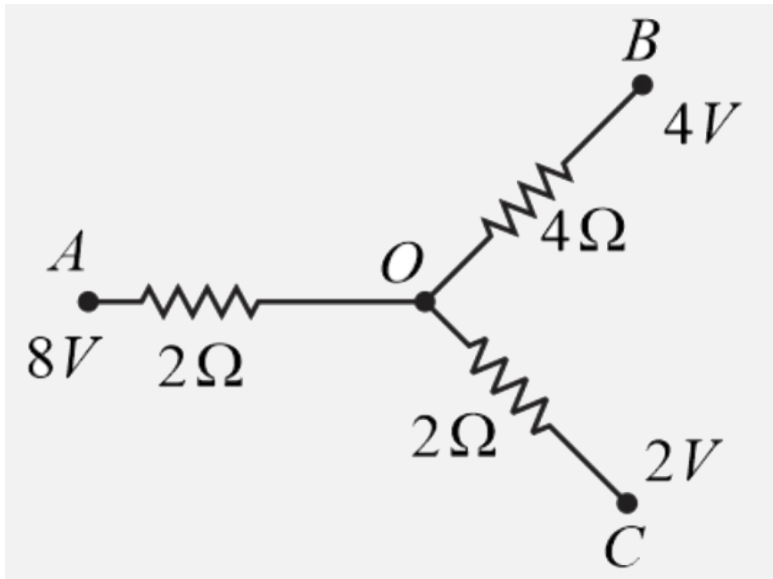
D. $\frac{3}{4} A$

Answer: A



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8. in the following network, the potential at O is



A. $4V$

B. $3V$

C. $6V$

D. $4.8V$

Answer: D



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9. An LCR circuit contains $R = 50\Omega$, $L = 1mH$ and $C = 0.1\mu F$. The impedance of the circuit will be minimum for a frequency of

A. $\frac{10^5}{2\pi} Hz$

B. $\frac{10^5}{2\pi} Hz$

C. $2\pi \times 10^5 Hz$

D. $2\pi \times 10^6 Hz$

Answer: A



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10. An Ac source of volatage $V=100 \sin 100\pi t$ is connected to a resistor of resistance 20Ω .The

rms value of current through resistor is ,
power factor is

A. $10A$

B. $\frac{10}{\sqrt{2}}A$

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

D. None of these

Answer: C



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11. The capacitance of a parallel plate capacitor is $2\mu F$ and the charge on its positive plate is $2\mu C$. If the charge on its plates is doubled, the capacitance of the capacitor

- A. remains $2\mu F$
- B. becomes $1\mu F$
- C. becomes $4\mu F$
- D. data insufficient

Answer: A



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12. Two capacitors of capacitance C are connected in series. If one of them is filled with dielectric substance K , what is the effective capacitance?

A. $\frac{KC}{(1 + K)}$

B. $C(K + 1)$

C. $\frac{2KC}{(1 + K)}$

D. None of these

Answer: A



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13. An artificial satellite is moving in a circular orbit around the earth with a speed equal to half the magnitude of escape velocity from the earth. The height of the satellite above the surface of the earth is xR . Find the value of x .

A. R

B. $2R$

C. 3 R

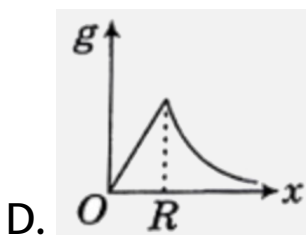
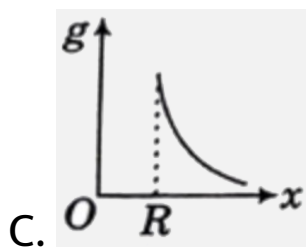
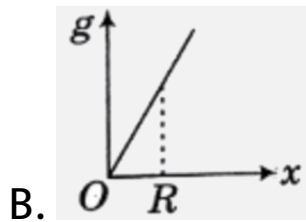
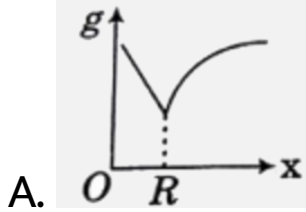
D. 4 R

Answer: A



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14. Variation of acceleration due to gravity (g) with distance x from the centre of the Earth is best represented by ($R \rightarrow$ Radius of the Earth)



Answer: D



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15. The rates of heat radiation from two patches of skin each of area A on a patient's chest differ by 2% . If the patch of the lower temp is at $300K$ and emissivity of both the patches is assumed to be unity, the temp of other patch would be .

A. 306 K

B. 312 K

C. 308.5 K

D. 301.5 K

Answer: D



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16. A Carnot engine whose low-temperature reservoir is at 350 K has efficiency of 50%. It is desired to increase this to 60%. If the temperature of the low-temperature reservoir remains constant, then the temperature of the high-temperature reservoir remains constant, then the temperature of the high-temperature

reservoir must be increased by how many degrees?

A. 15

B. 175

C. 100

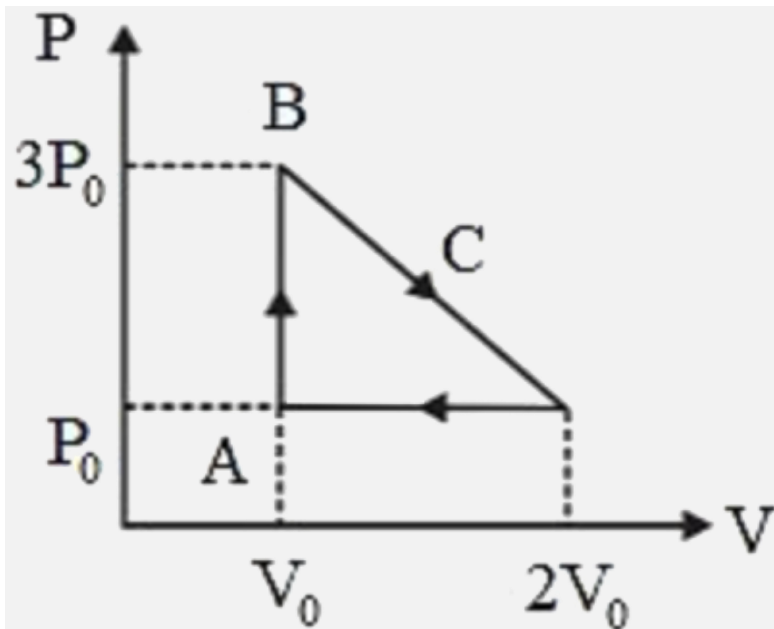
D. 50

Answer: B



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17. One mole of monoatomic gas is taken round the cyclic process. Heat absorbed by gas in process AB is



A. $2.5P_0V_0$

B. $3P_0V_0$

C. $3.5P_0V_0$

D. $4.5P_0V_0$

Answer: B



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18. A wire of length 100 m is tightly wounded on a hollow tube of radius 5 mm and length 1m . A current of 1 A is flowing in the wire. Then magnetic field strength inside the tube will be

: -

A. 4 T

B. 4 mT

C. 40 mT

D. 40 T

Answer: B



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19. A current carrying circular coil is bent so as to convert it into a double loop, both the loops being concentric and are carrying

current in the same direction. If B is the initial magnetic field at the centre, the final magnetic field at the centre will be

A. zero

B. B

C. $2B$

D. $4B$

Answer: D

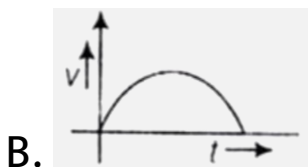
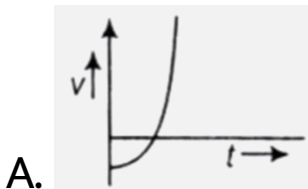


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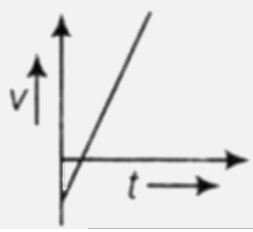
20. The displacement -time ($x-t$) graph of a body is given as



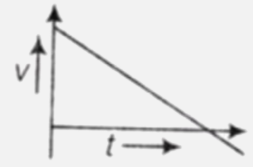
The corresponding velocity -time ($v-t$) graph will be



C.



D.



Answer: D



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21. An inclined plane making an angle β with horizontal. A projectile projected from the bottom of the plane with a speed u at angle α

with horizontal, then its maximum range R_{\max}

is

$$\text{A. } R_{\max} = \frac{u^2}{g(1 - \sin \beta)}$$

$$\text{B. } R_{\max} = \frac{u^2}{g(1 + \sin \beta)}$$

$$\text{C. } R_{\max} = \frac{u^2}{g(1 - \sin \beta)}$$

$$\text{D. } R_{\max} = \frac{u^2}{g(1 + \sin \beta)}$$

Answer: B



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22. A boy of mass 50 kg is climbing a vertical pole at a constant speed. If coefficient of friction between his palms and the pole is 0.75, then the normal reaction between him and the pole is (take $g = 10 \text{ m/s}^2$)

A. 700 N

B. 625.67 N

C. 550 N

D. 666.67 N

Answer: D



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23. A person observes that the full length of a train subtends an angle of 15° . If the distance between the train and the person is 3km, the length of the train, calculate using the parallax method, in meters is

A. 45

B. 45π

C. 250π

D. 75π

Answer: C



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24. A nucleus is bombarded with a high-speed neutron so that resulting nucleus is a radioactive one. This phenomenon is called

A. Artificial radioactivity

B. Fusion

C. Fission

D. Radioactivity

Answer: C



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25. ${}_{92}\text{U}^{235}$ undergoes successive disintegrations with the end product of ${}_{82}\text{Pb}^{203}$. The number of α and β particles emitted are

A. $\alpha = 6, \beta = 4$

B. $\alpha = 6, \beta = 0$

C. $\alpha = 8, \beta = 6$

D. $\alpha = 3, \beta = 3$

Answer: C



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26. A man measures the period of a simple pendulum inside a stationary lift and find it be T . If the lift accelerates downwards with an

acceleration of $g/3$, then the period of the pendulum will be

A. $\sqrt{\frac{2}{3}}T$

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

C. $T\sqrt{3}$

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

Answer: B



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27. A simple pendulum of length 'L' has mass 'M' and it oscillates freely with amplitude energy is

(g = acceleration due to gravity)

A. $\frac{MgA^2}{2L}$

B. $\frac{MgA}{2L}$

C. $\frac{MgA^2}{L}$

D. $\frac{2MgA^2}{L}$

Answer: A



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28. A radiation of energy E falls normally on a perfectly reflecting surface. The momentum transferred to the surface is

A. $\frac{E}{c}$

B. $\frac{2E}{c}$

C. Ec

D. $\frac{E}{c^2}$

Answer: B





29. A hydrogen-like atom emits radiation of frequency 2.7×10^{15} Hz when it makes a transition from $n = 2 \rightarrow n = 1$. The frequency emitted in a transition from $n = 3 \rightarrow n = 1$ will be

A. $3.2 \times 10^{15} \text{ Hz}$

B. $32 \times 10^{15} \text{ Hz}$

C. $1.6 \times 10^{15} \text{ Hz}$

D. $16 \times 10^{15} \text{ Hz}$

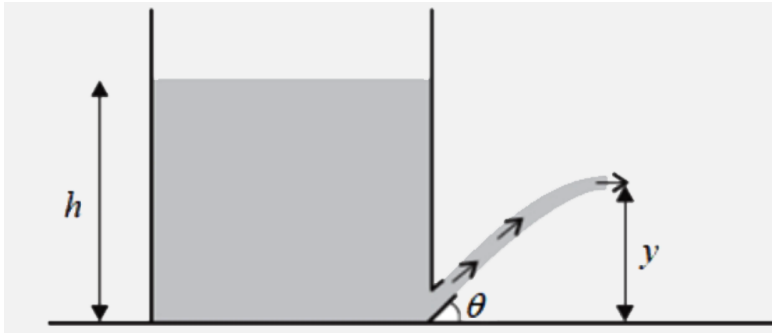
Answer: A



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30. A stream of non-viscous liquid emerges from a very short outlet tube at the base of a large . Open tank , in which the depth of liquid is h . The tube is at a fixed angle θ to the ground as shown in the figure. The maximum

height of the stream y is



A. $h \sin^2 \theta$

B. $h \sin 2\theta$

C. $\frac{1}{2} h \sin \theta$

D. $h \tan^2 \theta$

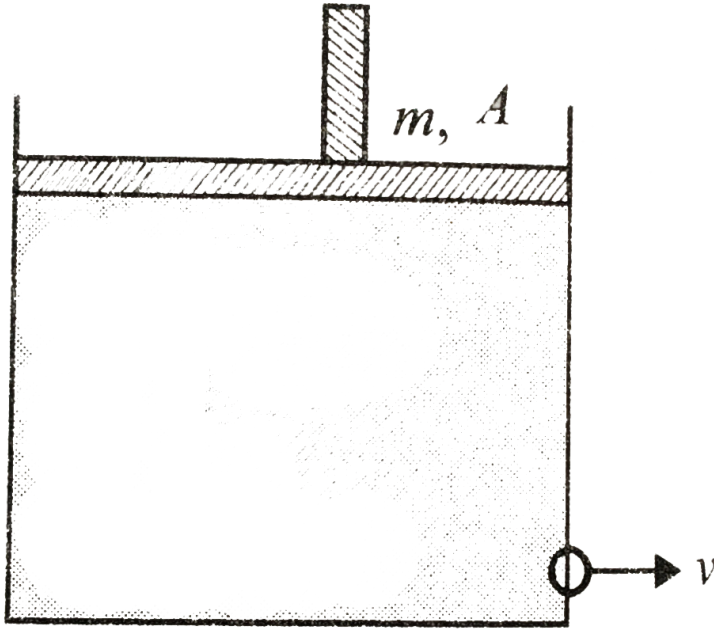
Answer: A



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31. A cylindrical vessel contains a liquid of density ρ up to height h . The liquid is closed by a piston of mass m and area of cross section A . There is a small hole at the bottom of the vessel. The speed v with which the

liquid comes out of the hole is



A. $\sqrt{2gh}$

B. $\sqrt{2\left(gh + \frac{mg}{\rho A}\right)}$

C. $\sqrt{2\left(gh + \frac{mg}{A}\right)}$

D. $\sqrt{2gh + \frac{mg}{A}}$

Answer: B



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32. A biconvex lens of focal length 15 cm is in front of a plane mirror. The distance between the lens and the mirror is 10 cm. A small object is kept at a distance of 30 cm from the lens.

The final image is

A. Virtual and at a distance of 16 cm from the mirror

B. Real and at a distance of 16 cm from the mirror

C. Virtual and at the distance of 20 cm from the mirror

D. None of the above

Answer: B



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33. A plane glass is placed over a various coloured letters (Violet, green, yellow ,red).

The letter which appears to be raised more is

A. Red

B. Yellow

C. Green

D. Violet

Answer: D



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34. A cylinder rolls down an inclined plane of inclination 30° , the acceleration of cylinder is

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

B. g

C. $\frac{g}{2}$

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

Answer: A



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35. A solid cylinder of mass 20kg rotates about its axis with angular velocity of $100\text{ radian } s^{-1}$. The radius of the cylinder is 0.25m . The magnitude of the angular momentum of the cylinder about its axis of rotation is

A. 62.6 J s

B. 70.4 J s

C. 79.6 J s

D. 60.5 J s

Answer: A





36. In an semiconductor the separation between conduction band and valence band is of the order of

A. 0 eV

B. 1 eV

C. 10 eV

D. 50 eV

Answer: B



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37. In a common emitter transistor amplifier, the output resistance is $500K\Omega$ and the current gain $\beta = 49$. If the power gain of the amplifier is 5×10^6 , the input resistance is

A. 165Ω

B. 198Ω

C. 225Ω

D. 240Ω

Answer: D



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38. A steel wire , of uniform area 2mm^2 , is heated up to 50°C and is stretched by tying its ends rigidly . The change in tension , when the temperature falls from 50°C to 30°C is

(Take

$$Y = 2 \times 10^{11} \text{Nm}^{-2}, \alpha = 1.1 \times 10^{-5} \text{C}^{-1})$$

A. $1.5 \times 10^{10} \text{N}$

B. $5N$

C. $88N$

D. $2.5 \times 10^{10} N$

Answer: C



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39. The number of significant figures in 45056

is

A. 2

B. 3

C. 4

D. 5

Answer: D



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40. Four sound sources produce the following four waves

(i) $y_1 = a \sin(\omega t + \phi_1)$

(ii) $y_2 = a \sin 2\omega t$

$$(iii) y_3 = a' \sin(\omega t + \phi_2)$$

$$(iv) y_4 = a' \sin(3\omega t + \phi)$$

Superposition of which two waves gives rise to interference?

A. (i) and (ii)

B. (ii) and (iii)

C. (i) and (iii)

D. (iii) and (iv)

Answer: C



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41. In a Young's double slit experiment, the fringe width is found to be 0.4mm . If the whole apparatus is immersed in water of refractive index $4/3$ without disturbing the geometrical arrangement, the new fringe width will be

A. 0.30 mm

B. 0.40 mm

C. 0.53 mm

D. 450 microns

Answer: A



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42. Beats are produced when two progressive waves of frequency 256 Hz and 260 Hz superpose. Then the resultant amplitude change periodically with frequency of

A. 256 Hz

B. 260 Hz

C. $\frac{256 - 260}{2} \text{ Hz}$

D. $4Hz$

Answer: D



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43. The equation of a progressive wave can be given by $Y = 15 \sin (660\pi t - 0.02\pi x)$ cm. The frequency of the wave is

A. 330 Hz

B. 342 Hz

C. 365 Hz

D. 660 Hz

Answer: A



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44. A 0.5kg block slides from the point A on a horizontal track with an initial speed 3m/s towards a weightless horizontal spring of length 1m and force constant 2N/m . The part AB of the track is frictionless and the part

BC has the coefficient of static and kinetic friction as '0.22' and 0.20 respectively. If the distances AB and BD are $2m$ and $2.14m$ respectively, find total distance through which the block moves before it comes to rest completely. ($g=10 \text{ m//s}^2$).

A. 2.5 m

B. 4.24 m

C. 4.24 m

D. 2.44 m

Answer: C



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45. A motor pump lifts 6 tonnes of water from a height of 25 m to a height 35m from the ground floor in 20 seconds. The power of the pump (in kW) is $[g = 10ms^{-2}]$

A. 3

B. 12

C. 1.5

D. 6

Answer: A



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