



# PHYSICS

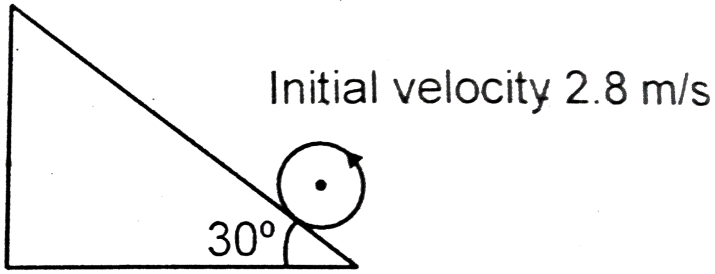
## BOOKS - AIIMS PREVIOUS YEAR PAPERS

### AIIMS 2019 25 MAY EVENING SHIFT

#### Physics

1. A Sphere pure rolls on a rough inclined plane with initial velocity  $2.8 \text{ m/s}$ . Find the

maximum distance on the inclined plane



A. 2.74 m

B. 5.48 m

C. 1.38 m

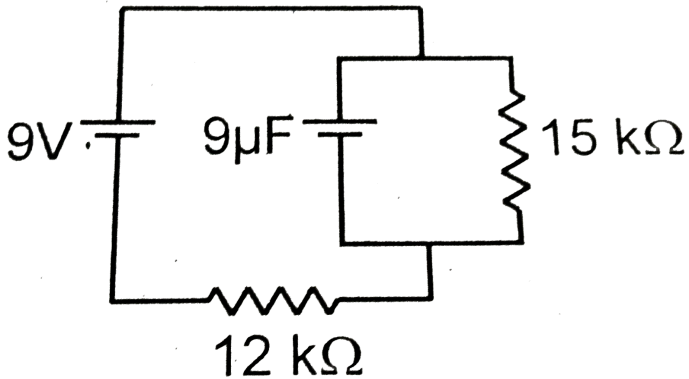
D. 3.2 m

**Answer: A**



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2. Calculate charge on capacitor in steady state.



A.  $20\mu C$

B.  $30\mu C$

C.  $45\mu C$

D.  $60\mu C$

**Answer: C**



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**3.** In LC oscillation resistance is  $100 \Omega$  and inductance and capacitance is  $1 \text{ H}$  and  $10\mu\text{F}$  .  
Find the half power of frequency .

A. 266.2

B. 366.2

C. 166.2

D. 233.2

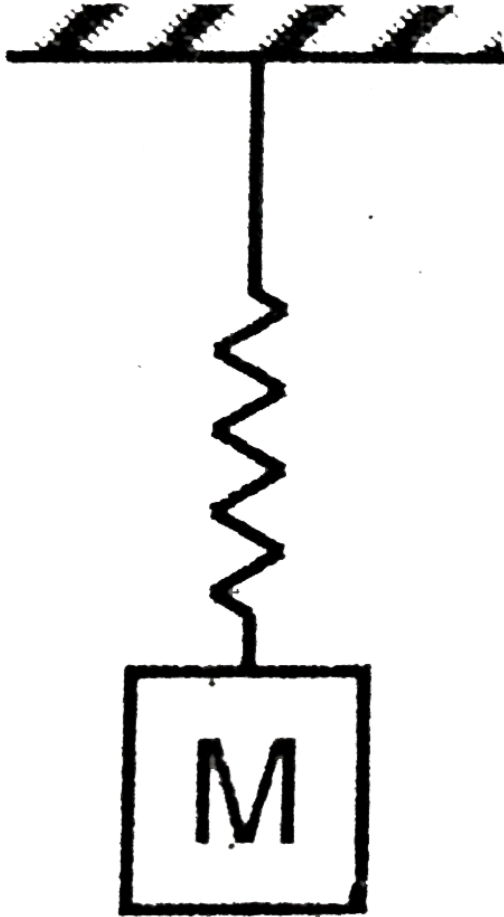
**Answer: A**



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4. Find the maximum tension in the spring if initially spring at its natural length when block

is released from rest.



A.  $mg$

B.  $mg/2$

C.  $3\text{mg}/2$

D.  $2\text{ mg}$

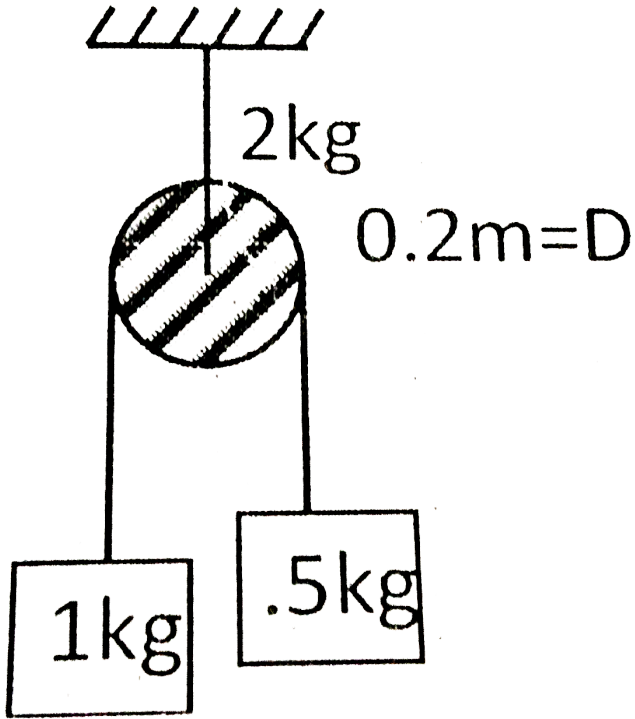
**Answer: D**



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5. For the given figure the acceleration of  $1\text{ kg}$  block if string is massless and mass of pulley is

2 kg and diameter of pulley is 0.2 m :-



A.  $2m / s^2$

B.  $2.5m / s^2$

C.  $0.2m / s^2$



D.  $1m / s^2$

**Answer: A**



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6. For a refrigerator , heat absorbed from source is 800 J and heat supplied to sink is 500 J then find coefficient of performance is :-

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

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

C.  $\frac{5}{3}$

D.  $\frac{3}{5}$

**Answer: C**



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7. In a transformer number of turns in primary circuit is 500 and in secondary circuit number of turns is 10 and load resistance is  $10 \Omega$  and voltage of secondary coil is 50 V then find the current in primary circuit .

A. 0.2A

B. 0.3A

C. 0.4A

D. 0.1A

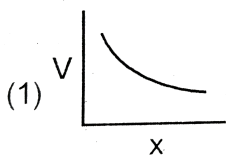
**Answer: D**



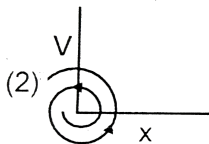
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**8.** In damped oscillation graph between velocity and position will be : -

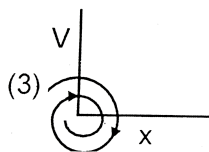
A.



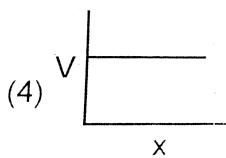
B.



C.



D.



**Answer: C**



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9. If two protons are moving with speed  $v = 4.5 \times 10^5 \text{ m/s}$  parallel to each other then find the ratio of electrostatic and magnetic force between them : -

A.  $4.4 \times 10^5$

B.  $2.2 \times 10^5$

C.  $3.3 \times 10^5$

D.  $1.1 \times 10^5$

**Answer: A**



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10. Find the gravitation field at a distance of 20000 km from centre of earth.

(Given

$$R_{\text{earth}} = 6400\text{km}, M_{\text{earth}} = 6 \times 10^{24}\text{kg}):$$

A.  $1.53\text{m} / \text{s}^2$

B.  $7.12\text{m} / \text{s}^2$

C.  $3.06\text{m} / \text{s}^2$

D.  $1.8\text{m} / \text{s}^2$

**Answer: C**



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**11.** Which of the following represents the dimension of capacitance ?

A.  $M^{-1}Li^{-2}A^2T^4$

B.  $ML^2A^{-2}T^{-4}$

C.  $MLA^{-1}T^{-4}$

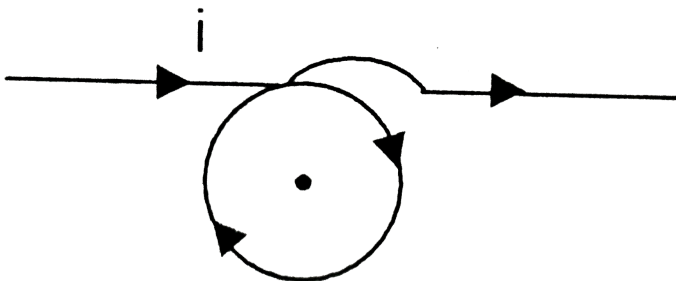
D.  $M^{-1}L^{-1}A^2T^2$

Answer: A



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12. In the given figure find out magnetic field at point B (Given :  $I=2.5A$ ,  $r=5cm$ )



A.  $\pi \times \left[ 1 + \frac{1}{\pi} \right] \times 10^{-5} T$

B.  $\pi \left[ 1 + \frac{1}{\pi} \right] \times 10^{-6} T$



$$\text{C. } \pi \left( \frac{\pi + 1}{\pi} \right) \times 10^{-6} T$$

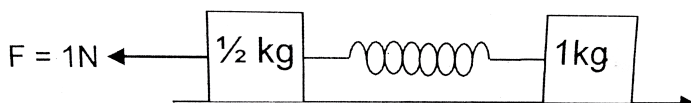
$$\text{D. } \left( \frac{\pi + 1}{\pi} \right) \times 10^{-6} T$$

**Answer: A**



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**13.** Initially spring is in natural length and both blocks are in rest condition. Then determine



maximum extension in spring .  $K = 20 \text{ N/M}$

A.  $\frac{20}{3} \text{ cm}$

B.  $\frac{10}{3} \text{ cm}$

C.  $\frac{40}{3} \text{ cm}$

D.  $\frac{19}{3} \text{ cm}$

**Answer: A**



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**14.** A transformer consists of 500 turn in primary coil and 10 turns in secondary coilk with the load of  $10\Omega$  Find out current in the

primary coil when the voltage across secondary coil 50V.

A. 0.3A

B. 0.1A

C. 0.5A

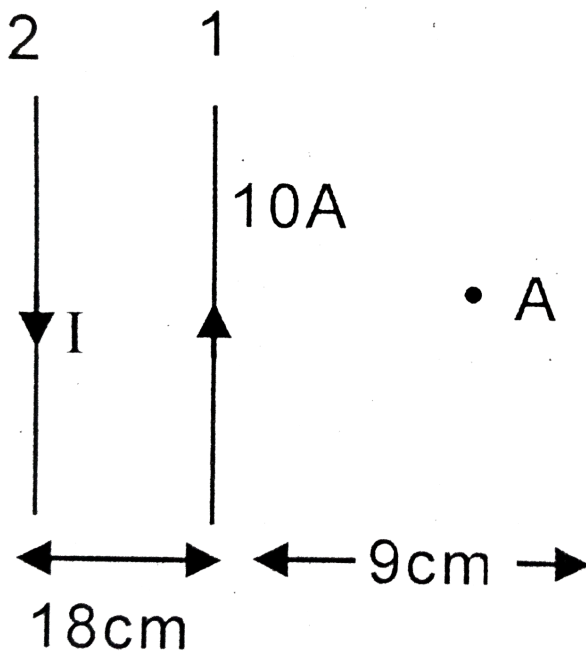
D. 0.7A

**Answer: B**



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15. In figure two infinitely long current carrying wires are shown . If resultant magnetic field at point A is zero. Then determine current  $I_1$  .



A. 50A

B. 15A

C. 30A

D. 25A

**Answer: C**



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**16.** A Carnot engine works between  $27^{\circ}C$  and  $127^{\circ}C$ . Heat supplied by the source is 500 J.

Then heat ejected to the sink is :

A. 1000 J

B. 667 J

C. 375 J

D. 500 J

**Answer: C**



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**17.** Find out work done to expand soap bubble to radius  $R = 5 \text{ cm}$  (surface tension of water =  $0.1 \text{ N/m}$ )

A.  $2.8 \times 10^{-3} J$

B.  $6.28 \times 10^{-3} J$

C.  $3.7 \times 10^{-3} J$

D.  $5.8 \times 10^{-3} J$

**Answer: B**

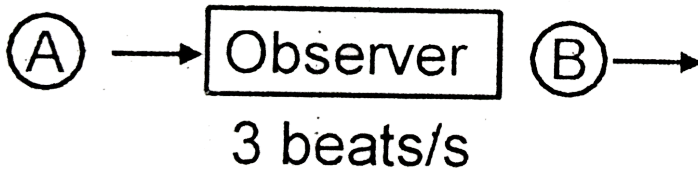


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**18.** Two sources of sound  $S_1$  and  $s_2$  are moving towards and away from a stationery observer with same speed respectively . Observer

detects 3 beats per second. Find speed of sources (approximately) .

Given,  $F_1 = F_2 = 500$  Hz, speed of air = 330 m/s



A. 1 m/s

B. 2 m/s

C. 3 m/s

D. 4 m/s

**Answer: A**





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19. In hydrogen atom find magnetic field at center in ground. State if Bohr's radius is

$$r_0 = 5 \times 10^{-11} \text{m.}$$

A. 15.20 T

B. 10.90 T

C. 13.95 T

D. 20.00 T

**Answer: C**



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20. 

- $20e^{-10} \mu C$
- $25e^{-10} \mu C$
- $30e^{-10} \mu C$
- $35e^{-10} \mu C$

**Answer: B**



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21. In a isobaric process the work done by a diatomic gas is 10 J , the heat given to the gas will be :

A. 35 J

B. 30 J

C. 45 J

D. 60 J

**Answer: A**



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22. A capacitor of capacitance 15 nF having dielectric slab of  $\epsilon_r = 2.5$  dielectric strength 30 MV/m and potential difference = 30 volt. Calculate the area of plate

A.  $6.7 \times 10^{-4} m^2$

B.  $4.2 \times 10^{-4} m^2$

C.  $8.0 \times 10^{-4} m^2$

D.  $9.85 \times 10^{-4} m^2$

**Answer: A**



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23. An ideal gas initially at pressure 1 bar is being compressed from  $30m^3$  to  $10m^3$  volume and its temperature decreases from 320 K to 280 K then find final pressure of gas.

A. 2.625 bar

B. 3.4 bar

C. 1.325 bar

D. 4.5 bar

**Answer: A**



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**24.** Distance between sun and earth is  $2 \times 10^8$  km, temperature of sun 6000 K, radius of sun  $7 \times 10^5$  km, if emmissivity of earth is 0.6 , then find out temperature of earth in thermal equilibrium.

A. 400 K

B. 300 K

C. 500 K

D. 600 K

**Answer: B**



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**25.** Number of visible lines in Balmer series.

A. 2

B. 4

C. 3

D. 5

**Answer: B**



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**26.** Ratio of electric and magnetic field due to moving point charge if its speed is  $4.5 \times 10^5 m/s$

A.  $2 \times 10^{11}$

B.  $3 \times 10^{11}$



C.  $2 \times 10^8$

D.  $3 \times 10^{12}$

**Answer: A**



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**27.** In toroid magnetic field magnetic field on axis will be radius = 0.5 cm, current = 1.5 A, turns = 250, permeability = 700

A. 7.5 Tesla

B. 10.5 Tesla

C. 4.5 Tesla

D. 15.5 Tesla

**Answer: B**



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**28.** The current density is a solid cylindrical wire a radius  $R$ , as a function of radial distance  $r$  is given by  $J(r) = J_0 \left( 1 - \frac{r}{R} \right)$ . The total

current in the radial region  $r = 0$  to  $r = \frac{R}{4}$  will

be :

A.  $\frac{5J_0\pi R^2}{32}$

B.  $\frac{5J_0\pi R^2}{96}$

C.  $\frac{3J_0\pi R^2}{64}$

D.  $\frac{J_0\pi R^3}{128}$

**Answer: B**



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29. In maxwell's speed distribution curve, for  $N_2$  gas, the average of |relative velocity| between two molecules at 300 k will be : -

A. 300 m/sec

B. 610 m/sec

C. 920 m/sec

D. zero

**Answer: B**



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30.  $N_2$  gas is heated from 300 K temperature to 600 K through an isobaric process. Then find the change in the entropy of the gas ( $n = 1$  mole )

A. 10 J/K

B. 20 J/K

C. 30 J/K

D. 40 J/K

**Answer: B**



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**31.** Assertion : In desert area, days get hot fastly and the nights get cold fastly .

Reason : The specific heat capacity for air and land is less than that of water.

A. If both assertion and reason are true and reason is the correct explanation of assertion.

B. If both assertion and reason are true but reason is the current explanation of

assertion.

C. If assertion is true but reason is false.

D. If both assertion and reason are false.

**Answer: A**



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**32. Assertion :** For communication antennae length should be comparable to  $\lambda$  ( $l \sim \lambda$ )

**Reason :** It leads to maximum power

A. If both assertion and reason are true and reason is the correct explanation of assertion.

B. If both assertion and reason are true but reason is the correct explanation of assertion.

C. If assertion is true but reason is false.

D. If both assertion and reason are false.

**Answer: C**



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**33.** Assertion: Amplitude modulation shows more interference than frequency modulation with noise.

Reason: Interference is function of amplitude of modulation wave with carrier wave.

A. If both assertion and reason are true and reason is the correct explanation of assertion.

B. If both assertion and reason are true but reason is the correct explanation of assertion.

C. If assertion is true but reason is false.

D. If both assertion and reason are false.

**Answer: B**



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**34.** Assertion: For an element generally  $N \geq Z$  (N = number of neutrons, Z = atomic number)

Reason: Neutrons always experience attractive nuclear force.

A. If both assertion and reason are true and reason is the correct explanation of assertion.

B. If both assertion and reason are true but reason is the correct explanation of

assertion.

C. If assertion is true but reason is false.

D. If both assertion and reason are false.

**Answer: B**



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**35.** Assertion : Positive feedback is essential for converting a transistor into an oscillator.

Reason : Positive feedback works between cut-off and saturation region.

A. If both assertion and reason are true and reason is the correct explanation of assertion.

B. If both assertion and reason are true but reason is not the correct explanation of assertion.

C. If assertion is true but reason is false.

D. If both assertion and reason are false.

**Answer: B**



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**36.** Assertion : Vibrational degree of freedom of a di-atomic gas molecule appears at every high temperature

Reason : Di-atomic gas has two vibrational degree of freedom in one direction.

A. If both assertion and reason are true and reason is the correct explanation of assertion.

B. If both assertion and reason are true but reason is the correct explanation of assertion.

C. If assertion is true but reason is false.

D. If both assertion and reason are false.

**Answer: B**



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**37.** Assertion :  $\text{NH}_3$  is liquidities more easily than  $\text{CO}_2$ .

Reason : Critical temperature of  $\text{NH}_3$  is more than  $\text{CO}_2$ .

A. If both assertion and reason are true and reason is the correct explanation of assertion.

B. If both assertion and reason are true but reason is the correct explanation of assertion.



C. If assertion is true but reason is false.

D. If both assertion and reason are false.

**Answer: A**



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**38.** Assertion : Even though net external force on a body is zero, momentum need not be conserved.

Reason : The internal interaction between

particles of a body cancels out momentum of each other

A. If both assertion and reason are true and reason is the correct explanation of assertion.

B. If both assertion and reason are true but reason is the correct explanation of assertion.

C. If assertion is true but reason is false.

D. If both assertion and reason are false.

**Answer: D**



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