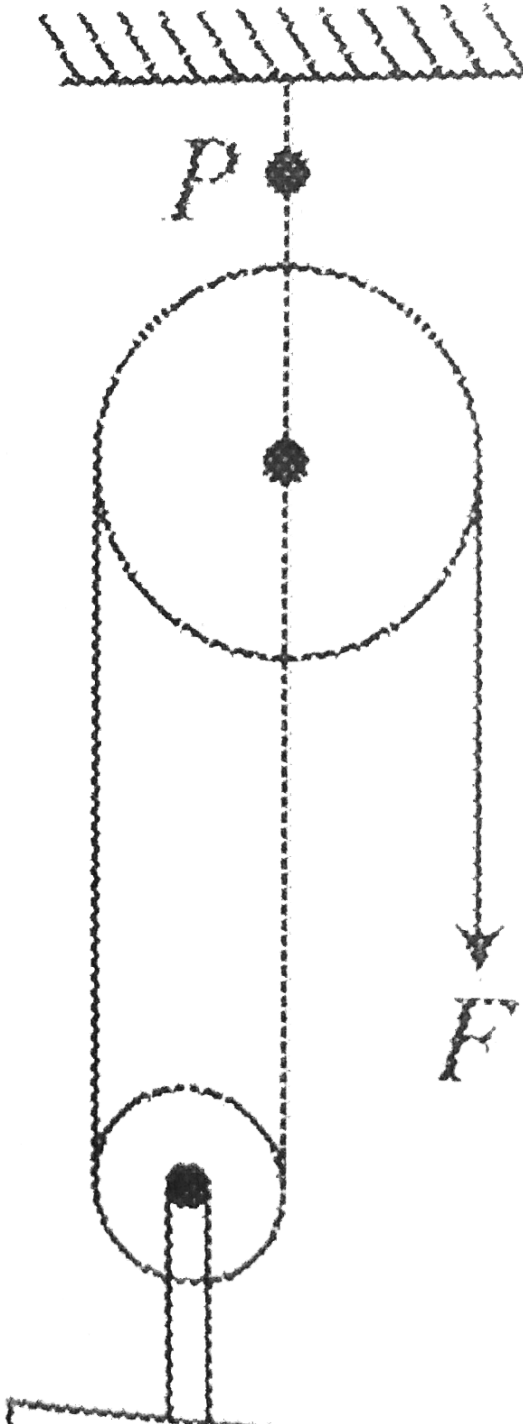# PHYSICS

BOOKS - AIIMS PREVIOUS YEAR PAPERS

AIIMS 2018 PAPER 1

Physics

1. In the diagram $100 kg$ block is moving up with constant velocity, then find out the

tension at point P :

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2. In a simple microscope of focal length $5cm$ final image is formed at D, then its magnification will be

A. 6

B. 5

C. 2

D. 1

Answer: A

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3. Centre of mass of a ring will be at a position:

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4. In a full wave rectifiers in which input voltage is represented by $V = V_M \sin \omega t$, then peak inversion voltage of non-conducting diode will be

   A. $-V_M$

   B. $V_M / 2$

   C. $2V_M$

   D. 0

Answer: C

5. A long cylindrical wire carrying current of $10A$ has radius of $5mm$ find its its magnetic field induction at a point $2mm$ from the centre of the wire

    A. $16 \times 10^{-4}T$

    B. $2.4 \times 10^{-4}T$

    C. $3.2 \times 10^{-4}T$

    D. $0.8 \times 10^{-4}T$

Answer: A

6. A parallel plate capacitor of $1\mu F$ capacity is discharging thorugh a resistor. If its energy reduces to half in one second. The value of resistance will be

A. $\dfrac{2}{\ln(2)} M\Omega$

B. $\dfrac{4}{\ln(2)} M\Omega$

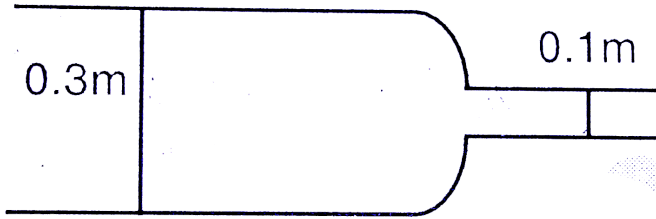C. $\dfrac{0}{\ln(2)} M\Omega$

D. $\dfrac{16}{\ln(2)} M\Omega$

Answer: A

7. Water is flowing in a non viscous tube as shown in the diagram. The diametre at a point A and B are 0.5m and 0.1m respectively. The pressure difference between points A & B are

$\triangle P = 0.8$ then find out the rate of flow:

0.3m

0.1m

8. Biot Savart law of magnetism is analogous to:

9. In a electro magnetic wave the expression for electric field is given by $E = 50\sin(\omega t - kx)$ the permeability is given $\mu = 4\mu_0$ & permittivity $\varepsilon_0 = \varepsilon_r$, then find the average intensity delivered.
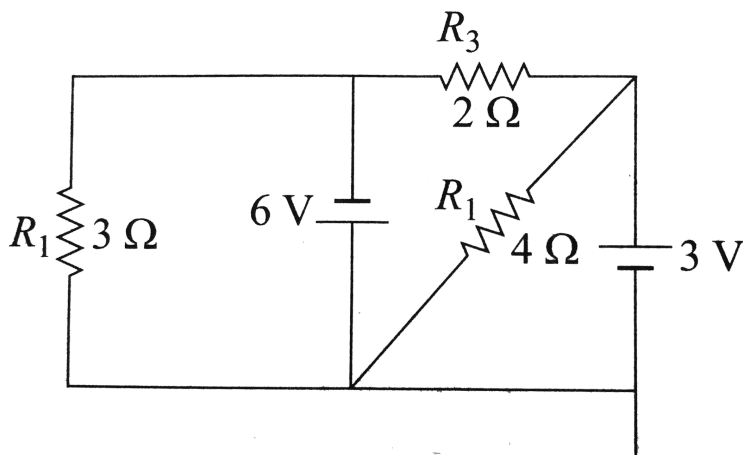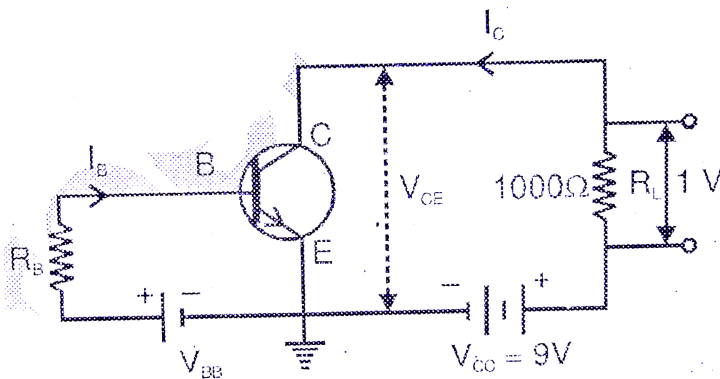
A. 1

B. 2

C. 3

D. 4

Answer:

10. In the diagram find out the current through 2Ω (R_3) :

11. An N-P-N transistor is connécted in common emitter contiguration in which collector supply is 9V and the voltage drop across the load resistance of 1000Ω connected in the collector circuit is 1V. If current amplification factor is (25/26), If the internal following options is incorrect.

12. In a hydragen spectrum third line of Balmer's series having wavelength λ. Find the binding energy o the ground state.
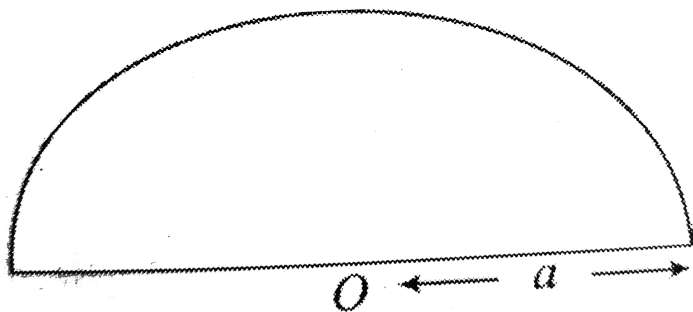
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13. A wire of some length is bent in the form of a ring of diameter $2a$ having self inductance L, then L will depend upon a as:

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14. What will be the position of centre of mass of a half disc shown ?

A. $\dfrac{2a}{\pi}$

B. $\dfrac{4a}{3\pi}$

C. $\dfrac{a}{\pi}$

D. $\dfrac{2a}{3\pi}$

Answer:

15. In a LCR series resonating circuit. Give the value of average power loss.

16. Find the minimum wavelngth of X - ray emitted by X - ray tube , which is operating at $15kV$ accelerating voltage.

17. A galvanometer gives full scale deflection of 1 volt when acting like a volmeter when connected in series with $2k\Omega$ resistance. The same galvanometer gives $500mA$, full scale deflection when acting like a ammeter when connected with shunt resistance of value 0.2Ω in parallel. Find out the resistance of galvanometer.

18. A uniformly charged non conducting disc with surface charge density $10nC/m^2$ having radius $R = 3cm$. Then find the value of electric field intensity at a point on the perpendicular bisector at a distance of

$r = 2cm$

2 cm
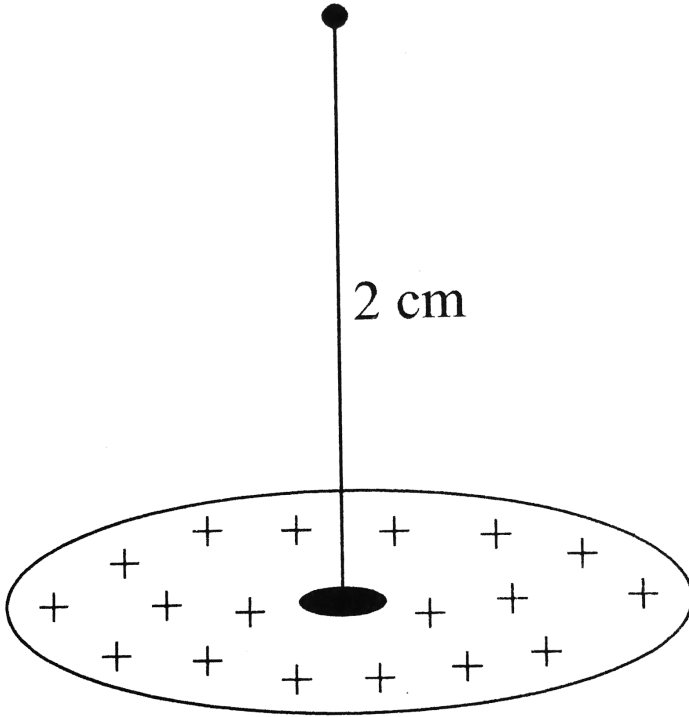
19. Two small balls, each having equal positive

charge Q are suspended by two insulationg

strings of equal length l from a hook fixed to a stand. It mass of each ball $= m$ and total angle between the two strings is $60°$ m, then find the charge on each ball.
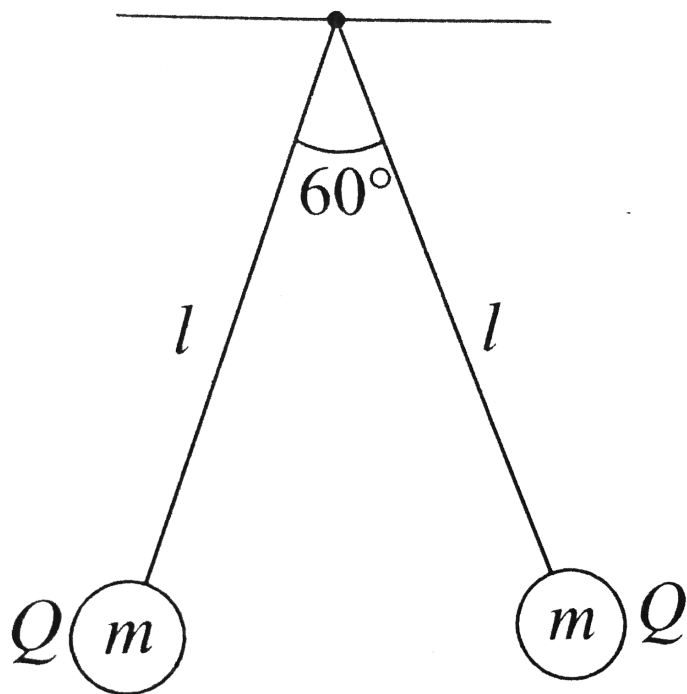
20. A magnetic material is placed in a non-uniform magnetic field which is orienteiong z-axis having then force gradient $= \dfrac{dH}{dz}$, experienced by the material will be equal to

21. A Rocket having initial mass $5 \times 10^6 kg$, which include mass of fuel of mass $4 \times 10^6 kg$ is ejecting gas with velocity $4000 m/s$ relative

to Rocket. Then what will be the velocity of rocket when entire fuel finishes?

22. In a single slit diffraction method, the distance between slit and screen is $1m$. The size of the slit is $0.7mm$ and second maximum is formed at the distance of $2mm$ from the centre of the screen, then find out the wavelength of light.

23. In a solar cell, current is generated due to bond breakage in which region?

A. depletion region

B. n-region

C. p-region

D. None of these

Answer:

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24. In a modulated signal the maximum amplitude is 15 Volt and minimum amplittde is 5 Volt, then amplitude of signal wave will be:

25. In a series LR circuit $(L = 3H, R = 1.5\Omega)$ and DC voltage $= 1V$. Find current at $T = 2$ seconds.

26. One gram of water $(1cm^3)$ becomes $1671cm^3$ of steam when boiled at a constant pressure of 1 atm $(1.013 \times 10^5 Pa)$. The heat of vaporization at this pressure is $L_v = 2.256 \times 10^6 J/kg$. Compute (a) the work done by the water when it vaporizes and (b) its increase in internal energy.

**27.** In the figure shown S is the saurce of white light kept at a distance x_0 frorn the plane of

the slits. The source moves with a constant

specd u towards the slits on the line

perpendicular to the plane of the slits and

passing through the slit S_1. Find the

instanteneous velocity (magnituce and

direction). of the central maxima at time t

having range $0 \le t < < \dfrac{x_0 - d}{u}$. Assume
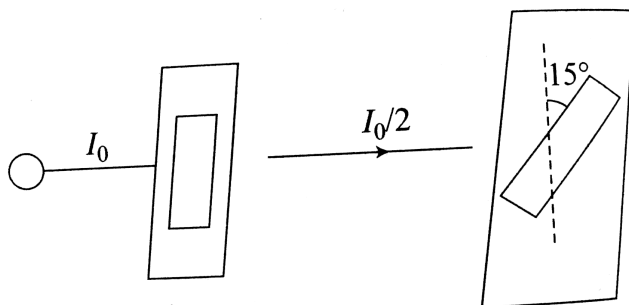
that $D >> d.$
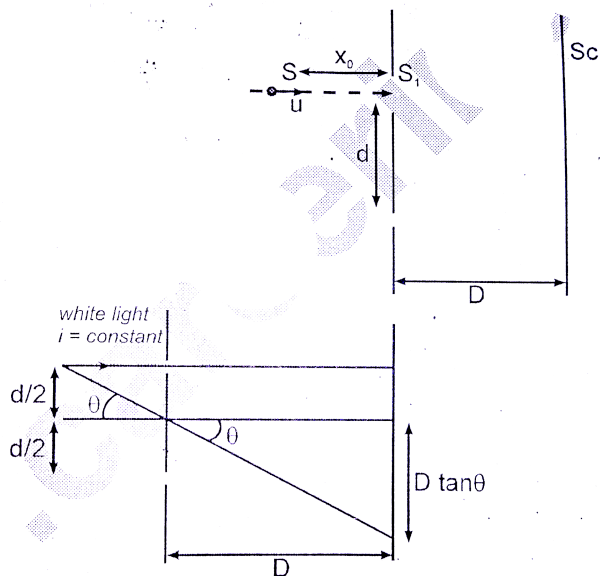
28. Light is incident on a polarizer with intensity I_0. A second prism called analyzer is kept at a angle of $15°$, from the first polarizer

then the intensity of final emergent light will

be

29. A satellite orbiting certain planet has

apogee R_1 and perigee equal to R_2, then find

the minimum kinetic energy that should be

given to the satellite to enable it to escape the planate.

30. Assertion : Rainy clouds appear dark from below.

Reason : There is not sufficient light which can be scattered by these clouds.

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

assertion.

B. If both assertion and reason aro 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: A

31. Assertion: Magnetic field can not change the kinetic energy of moving charges.

Reason: Magnetic field can not change velocity vector.

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

B. If both assertion and reason are truo 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 lalse,

Answer: C

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32. Assetrion: Net electric field insider conductor is zero

Reason: Total positive charge equals to total negative charge in a conductor

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 reasón 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: C

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33. Assertion: All the charge in a conductor gets distributed on whole of its outer surface.

Reason: In a dynamic system, charges try to keep their potential energy minimum.

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: A

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34. Assertion: Water waves in a river are not

polarized.

Reason: Water waves are longitudinal in

nature.

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: A

35. Assertion: In a string wave, during reflection from fix boundary, the reflected wave is inverted.

Reason: The force on string by clamp is in downward direction while string is pulling the clamp is upward 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 not 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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36. Assertion : Surface tensian decreases with increase in temperature.

Reason : On increasing temperature kinetio energy increases and intermolecular forces decreases.

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: A

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37. Torque on a body can be zero even if there is a net force on it.

Torque and force on a body are always perpendicular.

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 asserlion and reason are false.

Answer: B