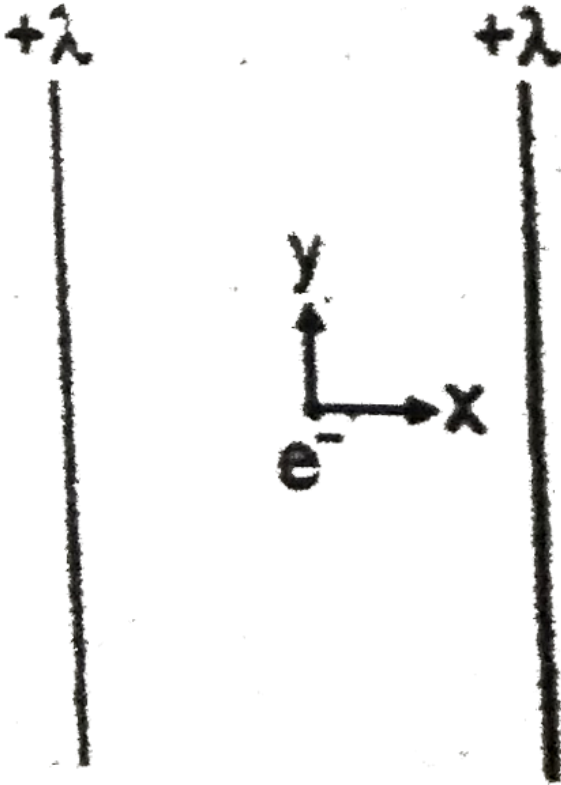# PHYSICS

RESONANCE ENGLISH

FULL TEST 2

Exercise

1. An electron is placed just in the middle between two

long fixed line charges of charge density $+\lambda$ each. The

wires are in the xy plane (do not consider gravity)

A. a.The equilibrium of the electron will be stable

along x-direction

B. b.the equilibrium of the electron will be stable

along y-direction

C. c.the equilibrium of the electron will be unstable

along y-direction

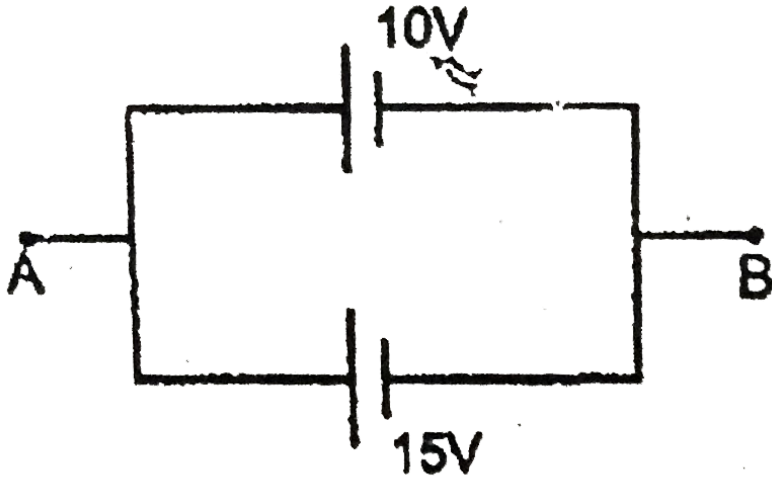D. d.the equilibrium of the electron will be stable

along z-direction

Answer: D

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2. Two cells of e.m.f. 10V & 15V are connected in parallel

to each other between points A&B. The cell of e.m.f. 10V

is ideal but the cell of e.m.f. 15V has internal resistance

1Ω. The equivalent e.m.f. between A and B is:

A. 25/2 V

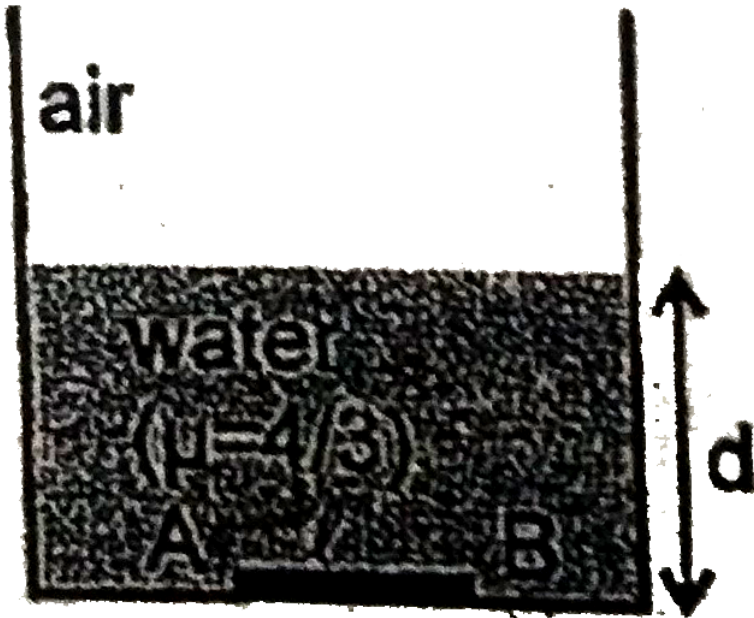B. not defined

C. 15 V

D. 10 V

Answer: D

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3. AB is small object dipped in water at a depth of d. Its length is l. It is seen from air at near normal incidence. The length of the image is:
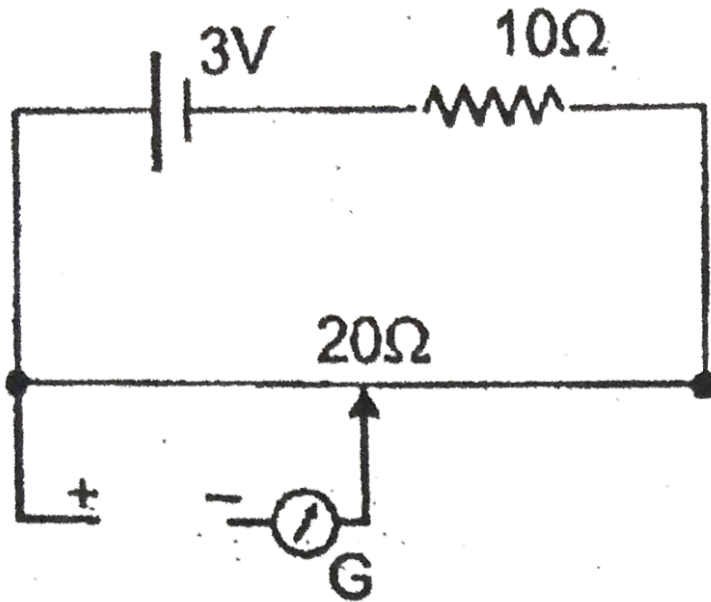

A. a.l

B. b.μl

C. $c.l/\mu$

D. d .none of these

Answer: A

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4. A 10m long potentiometer wire has a resistance of 20 ohm. It is connected in series with a battery of emf 3V and a resistance of 10Ω. The internal resistance of cell is negligible. If he length can be read accurately up 10

1mm, the potentiometer can read voltage.
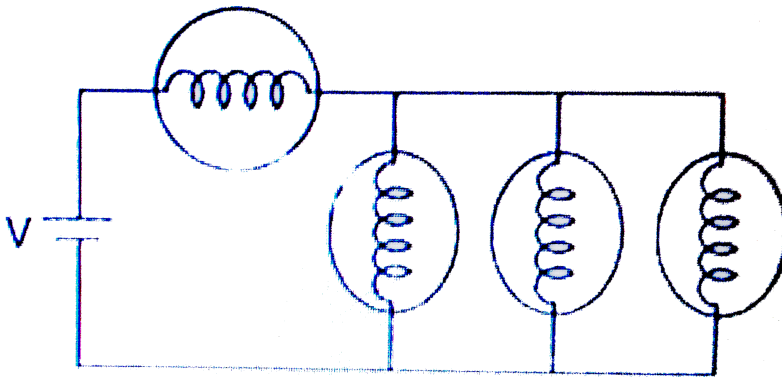

A. up to minimum of 0.2 mV

B. with an accuracy of 0.2 mv

C. with an accuracy of 0.1 mV

D. up to minimum of 2V

Answer: B

5. Four identical bulbs each rated 100 watt, 220 volts are connected across a battery of emf 220 V as shown. The total electric power consumed by the bulbs is

A. 75 watt

B. 400 watt

C. 300 watt

D. 400/3 watt

Answer: A

6. Two cylindrical conductors A and B of same metallic material have their diameters in the ratio 1:2 and lengths in the ratio 2:1. If the temperature difference between their ends is same, the ratio of heats conducted respectively by A and B per second is,
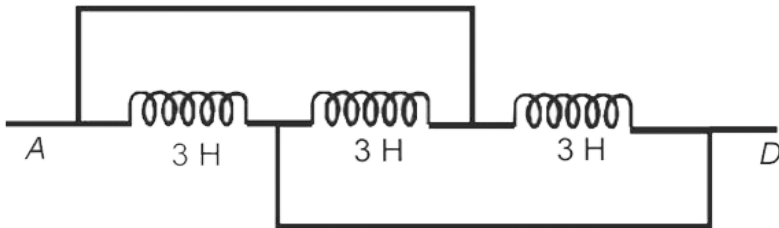
A. $1:2$

B. $1:4$

C. $1:16$

D. $1:8$

Answer: D

7. The inductance between A and D is

A. 3.66H

B. 9H

C. 0.66H

D. 1H

Answer: D

8. Part of uranium decay series is shown

$$_{.92}U^{234} \rightarrow _{.90}Th^{234} \rightarrow _{.91}Pa^{234} \rightarrow _{.90}Th^{230} \rightarrow _{.88}Ra^{226}$$
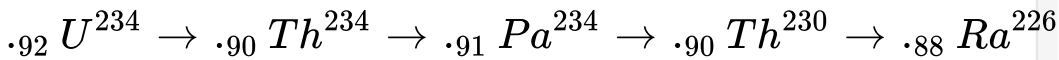
How many parts of isotopes are there in the above series
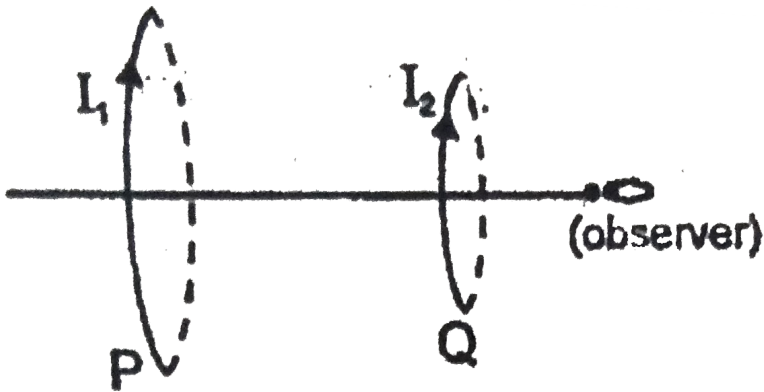
A. 1

B. 2

C. 3

D. 4

Answer: B

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9. Two circular coils P & Q are coaxially & carry currents I_1 and I_2 respectively (all direction are w.r.t. the observer)

A. If $I_2 = 0$ and P moves towards Q, a current in the same direction as I_1 is induced in Q

B. If $I_1 = 0$ and Q moves towards P,a current in the oppsite direction to that I_2 is induced in P,

C. when $I_1 \neq 0$ and $I_2 \neq 0$ are in the same direction then the two coils tend to move apart.

D. when $I_1 \neq 0$ and $I_2 \neq 0$ are in opposite directions then the coils attract each other

Answer: B

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10. A current carrying ring is placed in a horizontal plane. A charged particle is dropped along the axis of the ring to fall under the influence of gravity

    A. the current in the ring may increases

    B. the current in the ring may decreases

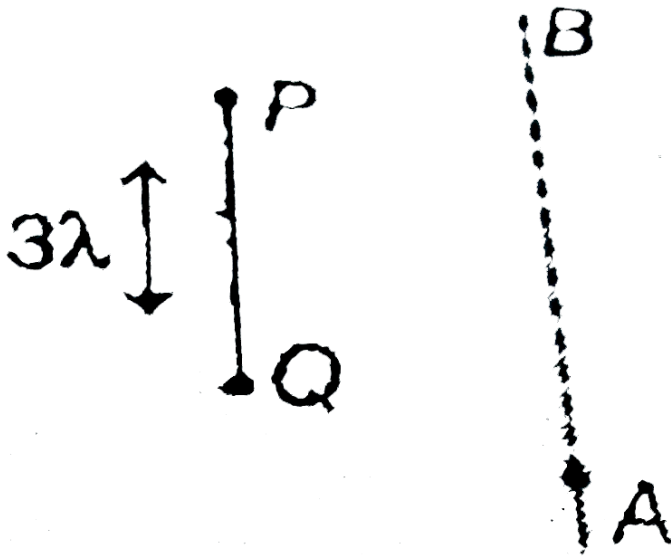   C. the velocity of the particle will continuously increase till reaches the centre of the ring

    D. the acceleration of particle will decreases continuously till it reaches the centre

Answer: C

11. Two coherent ligh sources each of wavelength λ are separated by a distance 3λ. The maximum number of minimas formed on line AB which runs from $-\infty$ to $+\infty$ is

A. 2

B. 4

C. 6

D. 8

Answer: C

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12. In a single-slit diffraction experiment, the width of the slit is made half of the original width:

A. the width of the central maxima becomes double

B. the width of the maxima becomes half

C. the width of the central maxima becomes one fourth

D. the width of the central maxima becomes four

   times.

Answer: A

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13. In the figure a part of electric circuit is given. The

value of each resistance is R and current in some parts is

shown in the diagram. Then current in AB branch is:

A. 21A

B. 25A

C. 29A

D. 33A

Answer: C

14. A parallel plate capacitor is charged to a potential difference V by a dc source. The capacitor is then disconnected from the source. If the distance between the plates in doubled, state with reason how the following will change,

(i) electric field between the plates,

(ii) capacitance and

(iii) energy stored in the capacitor.

  A. only (i) and (ii)

  B. only (i) and (iii)
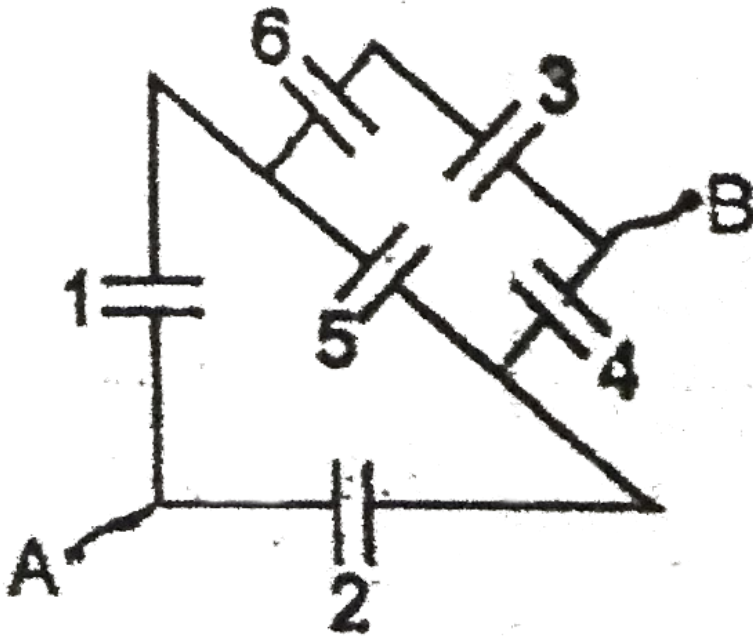
  C. only (ii) and (iii)

D. All (i),(ii) and (iii)

Answer: A

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15. Find the equivalent capacitance of the circuit between the points 'A' and 'B'. All capacitors are in

microfarad.

A. $2\mu F$

B. $3\mu F$

C. $4\mu F$

D. $5\mu F$

Answer: A

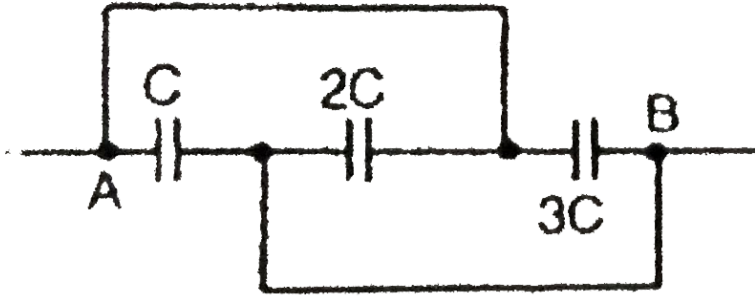**16.** (a) Define the SI unit of capacitance.

A. coulomb

B. volt

C. henry

D. farad

Answer: D

17. Capacitance of a system of capacitors between points A and B shown in the given figure.
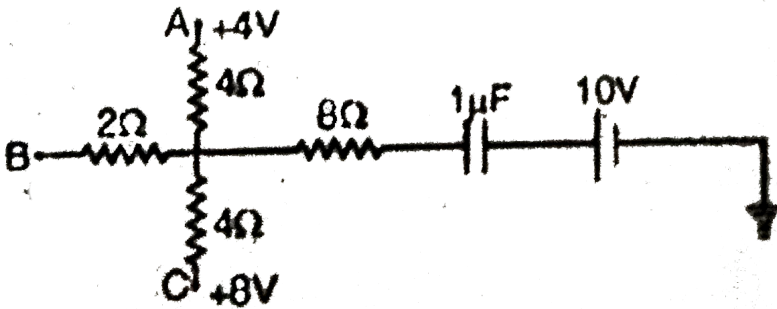

A. C/3

B. 6C

C. 3C

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

Answer: B

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18. Figure shows a part of network of a capacitor and resistors. The potential indicated at A, B and C are with respect to the ground. The charge on the capacitor on the capacitor in steady state is

A. $4\mu C$

B. $6\mu C$

C. $10\mu C$

D. $16\mu C$

Answer: A

19. The minimum sum of the distances of a real object and a real image from a concave mirror of radius of curvature 20cm is:

    A. a.10 cm

    B. b.40 cm

    C. c.20 cm

    D. d.none of these

Answer: B

20. A man is standing at the edge of a 1m deep swimming pool, completely filled with a liquid of refractive index $\sqrt{\dfrac{3}{2}}$. The eyes of the man are $\sqrt{3}$m above the ground. A coin located at the bottom of the pool appears to be an angle of depression of $30°$ with reference to the eyes of man. Then horizontal distance (represented by x in the figure) of the coin from the eye
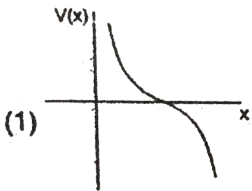
of the man is ....mm.
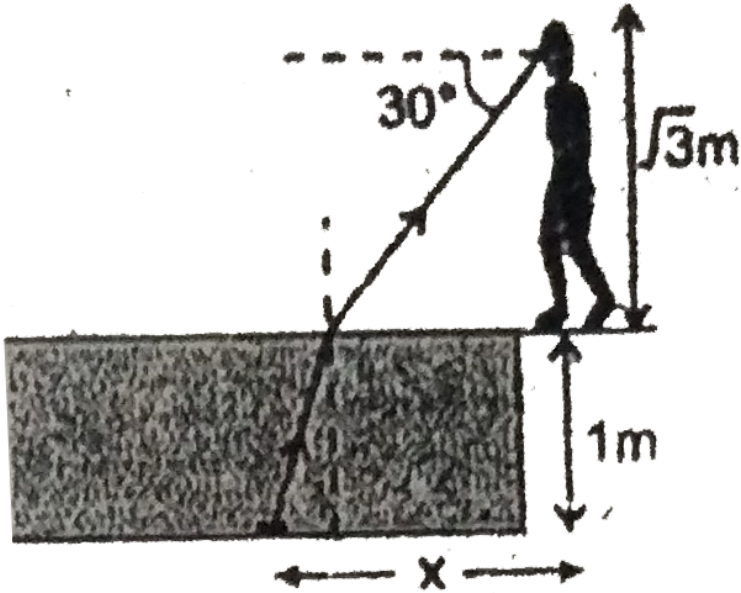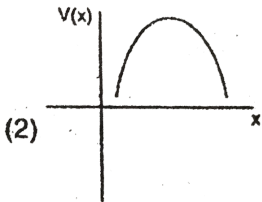

A. 2000

B. 3000

C. 4000

D. 8000

Answer: C

21. Which graph(s) show(s) the correct distribution of potential (at the points between them) due to two like point charges. [X= distance from the charge on left]

A.

(1)

B.

(2)

C.

(3)

(4)

D.
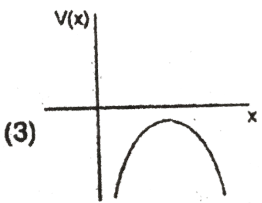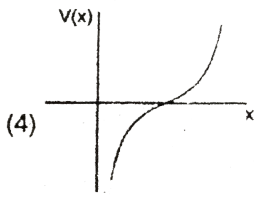
Answer: C

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22. If μ_1 and μ_2 are the refractive indices of the materials of core and cladding of an optical fibre, then the of light due to its leakage can be minimised by having

A. $\mu_1 > \mu_2$

B. $\mu_1 < \mu_2$

C. $\mu_1 = \mu_2$

D. none of these

Answer: A

23. Charge Q is uniformly distributed only on curved surface of a thin hemispherical shell. A,B and C are three points on the circular base of hemisphere, such that A is the centre. Let the electric potential at points A, B and C

be V_A, V_B, V_C respectively. Then

A. $V_A > V_B > V_C$

B. $V_C > V_B > V_A$

C. $V_B > V_A$ and $V_B > V_C$

D. $V_A = V_B = V_C$

Answer: D

24. A metal disk of radius a rotates with a constant angular velocty ω about its axis. The potential difference between the centre and the rim of the disc is (m=mass of electron, e=charge on electron)

A. zero

B. $\dfrac{m_0\omega^2 R^2}{2e}$

C. $\dfrac{m_0\omega R^3}{3e}$

D. $\dfrac{em_0\omega R^2}{2}$

Answer: B

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25. Which of the following EM ratiation has least wavlenght ?

A. γ-rays

B. β-rays

C. α-rays

D. X-rays

Answer: A

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26. A solid conducting sphere of radius a is enclosed in a concentric shell of radius $b > a$. The charge on the inner

sphere is $3\mu C$ and on the conducting shell is $-10\mu C$.

The potential difference between the conductors is V. If

$+10\mu C$ additional charge is given to the outer shell, the

new potential difference is

A. V

B. V/2

C. 2V

D. zero

A. V

B. V/2

C. 2V

D. zero

Answer: A

27. The characteristic X-ray radiation is emitted when

A. the bombarding electrons knock out electrons from the inner shell of the target atoms and one of the outer electrons falls into this vacancy

B. the valance electrons are removed from the target atoms as a result of the collision

C. the source of electrons emits a mono energetic bean

D. the electrons are accelerated to a fixed energy

A. the bombarding electrons knock out electrons from the inner shell of the target atoms and one of the outer electrons falls into this vacancy

B. the valance electrons are removed from the target atoms as a result of the collision

C. the source of electrons emits a mono energetic bean

D. the electrons are accelerated to a fixed energy

Answer: A

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28. Intelset satellite works as a -

A. transmitter

B. repeater

C. absorber

D. none of these

Answer: B

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29. Statement 1: A pendulum made of an insulated rigid massless rod of length l is attached to a small sphere of mass m and charge q. The pendulum is undergoinng

oscillations of small amplitude having time period T. Now a uniform horizontal magnetic field $\vec{B}$ out of plane of page is switched on. As a result of this change, the time period of oscillations does not change.
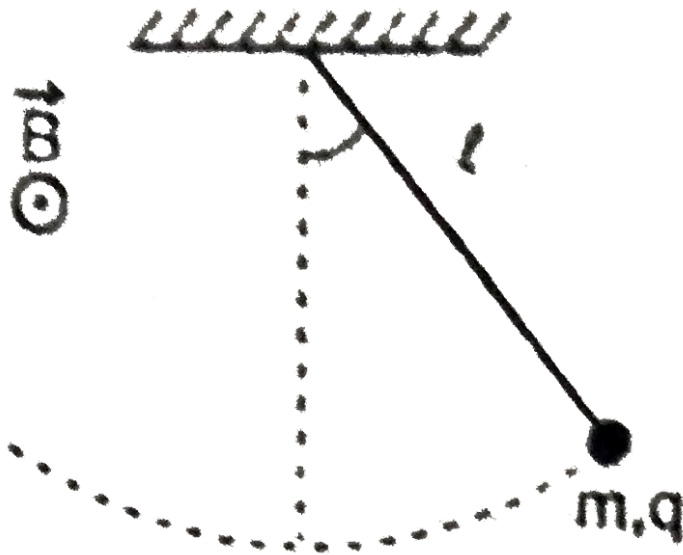
Statement 2: A force acting along the string on the bob of a simple pendulum (such that tension in string is never zero) does not produce any restoring torque on the bob about the hinge.

A. Statement-1 is true, Statement-2: is true, Statement-2 is a correct explanation for Statement-1.

B. Statement-1 is true, Statement-2: is true, Statement-2 is NOT a correct explanation for Statement-1.

C. Statement-1 is true but statement-2 is false

D. Statement-1 is false, Statement-2 is true

Answer: A

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30. Assertion : Television signals are received through sky-wave propagation.

Reason : The ionosphere reflects electromagnetic waves of frequencies greater than a certain critical frequency.

A. Statement-1 is true, Statement-2: is true, Statement-2 is a correct explanation for Statement-1.

B. Statement-1 is true, Statement-2: is true, Statement-2 is NOT a correct explanation for Statement-1.

C. Statement-1 is true but statement-2 is false

D. Statement-1 is false, Statement-2 is true

Answer: D

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