



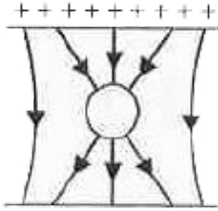
PHYSICS

BOOKS - KCET PREVIOUS YEAR PAPERS

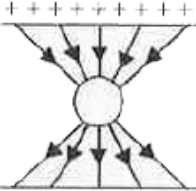
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Physics

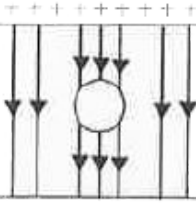
1. An uncharged sphere of metal is placed inside a charged parallel plate capacitor. The lines of force will look like



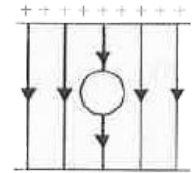
A.



B.



C.



D.

Answer: A



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2. A wire has a resistance of $6\ \Omega$. It is cut into two parts and both half values are connected in parallel. The new resistance is

A. $3\ \Omega$

B. $6\ \Omega$

C. $12\ \Omega$

D. $1.5\ \Omega$

Answer: D



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3. A current flows in a conductor from east to west, The direction of the magnetic field at a point above the conductor is

A. towards east

B. towards west

C. towards north

D. towards south

Answer: C



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4. A bar magnet is equivalent to

- A. toroid carrying current
- B. straight conductor carrying current
- C. solenoid carrying current
- D. circular coil carrying current

Answer: C



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5. Excitation energy of a hydrogen like ion in its first excitation state is 40.8 eV. Energy needed to remove the electron from the ion in ground state is

A. 40.8 eV

B. 27.2 eV

C. 54.4 eV

D. 13.6 eV

Answer: C



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6. The refractive index of a particular material is 1.67 for blue light, 1.65 for yellow light and 1.63 for red light. The dispersive power of the material is

- A. 0.031
- B. 1.60
- C. 0.0615
- D. 0.024.

Answer: C



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7. An ideal gas heat engine operates in a Carot's cycle between $227^{\circ}C$ and $127^{\circ}C$. It absorbs 6×10^4 J at high temperature. The amount of heat converted into work is

A. $1.6 \times 10^4 J$

B. $1.2 \times 10^4 J$

C. $4.8 \times 10^4 J$

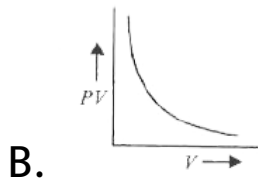
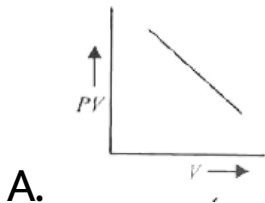
D. $3.5 \times 10^4 J$

Answer: B

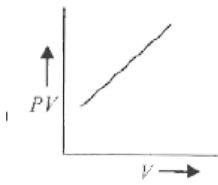


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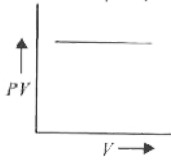
8. Which of the following graphs represent the behaviour of an ideal gas ?



C.



D.



Answer: D



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9. Rainbow is formed due to

A. total internal reflection

B. scattering

C. refraction

D. dispersion and total internal reflection.

Answer: D



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10. A beam of parallel rays is brought to a focus by a plano-convex lens. A thin concave lens of the same focal length is joined to the first lens. The effect of this is

A. the focus shifts to infinity

B. the focal point shifts towards the lens by
a small distance

C. the focal point shifts away from the lens
by a small distance

D. the focus remains undisturbed.

Answer: A



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11. When a body is earth connected, electrons from the earth flow into the body. This means the body

A. charged negatively

B. an insulator

C. unchanged

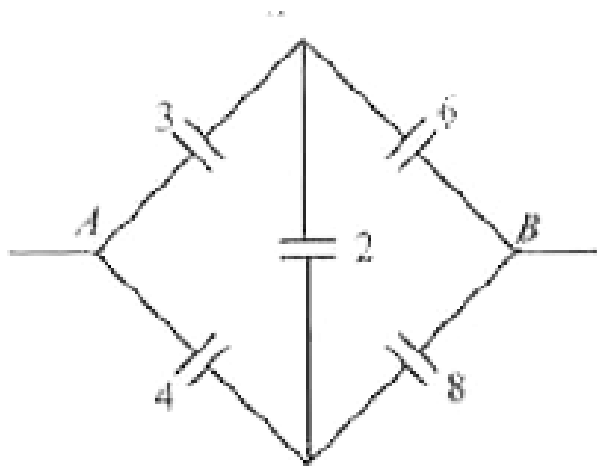
D. charged positively,

Answer: D



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12. Effective capacitance between A and B in the figure shown is all capacitances are in μF



A. $\frac{3}{14} \mu F$

B. $\frac{14}{3} \mu F$

C. $21 \mu F$

D. $23 \mu F$

Answer: B



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13. Which state of triply ionised beryllium (Be^{+++}) has the same orbital radius as that of the ground state of hydrogen?

A. $n = 3$

B. $n = 4$

C. $n = 1$

D. $n = 2$

Answer: D



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14. If M is the mass of a nucleus and A its atomic mass, then the packing fraction is:

A. $\frac{M}{M - A}$

B. $\frac{M - A}{A}$

C. $\frac{A}{M - A}$

D. $\frac{A - M}{A}$

Answer: B



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15. A count rate meter shows a count of 240 per minute from a given radioactive source. One hour later the meter shows a count rate of 30 per minute. The half-life of the source is

A. 80 min

B. 120 min

C. 20 min

D. 30 min

Answer: C



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16. Two conductors of the same material have their diameters in the ratio $1 : 2$ and their lengths in the ratio $2:1$. If the temperature difference between their ends is the same, then the ratio of amounts of heat conducted per second through them will be

A. 4: 1

B. 1: 4

C. 8: 1

D. 1: 8

Answer: D



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17. Blowing air with open mouth is an example of
of

- A. isobaric process
- B. isochoric process
- C. isothermal process
- D. adiabatic process

Answer: A



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18. Sound waves in air are always longitudinal because,

- A. of the inherent characteristics of sound waves in air
- B. air does not have a modulus of rigidity
- C. air is a mixture of several gases
- D. density of air is very small

Answer: B



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19. In Young's double slit experiment if monochromatic light is replaced by white light

A. no fringes are observed

B. only central fringe is white, all other fringes are coloured

C. all bright fringes become white

D. all bright fringes have colours between violet and red.

Answer: B





20. In a Young's double slit experiment, the separation between the two slits is 0.9mm and the fringes are observed one metre away. If it produces the second dark fringe at a distance of 1mm from the central fringe, the wavelength of the monochromatic source of light used is

A. 450nm

B. 400nm

C. $500nm$

D. $600nm$

Answer: D



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21. When light is incident on a diffraction grating, the zero order principal maximum will be

A. spectrum of the colours

B. white

C. one of the component colours

D. absent

Answer: B



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22. H-polaroid is prepared by

A. orienting herapathite crystal in the same
direction in nitrocellulose

B. using thin tourmaline crystals

C. stretching polyvinyl alcohol and then heated with dehydrating agent

D. stretching polyvinyl alcohol and then impregnating with iodine.

Answer: D



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23. SI unit of permittivity is

A. $C^2 m^2 N^2$

B. $C^2 m^{-2} N^{-1}$

C. $C^2 m^2 N^{-1}$

D. $C^{-1} m^2 N^{-2}$

Answer: B



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24. A spherical drop of capacitance $1 \mu F$ is broken into eight drops of equal radius. Then, the capacitance of each small drop is

A. $\frac{1}{2}\mu F$

B. $\frac{1}{4}\mu F$

C. $\frac{1}{8}\mu F$

D. $8\mu F$

Answer: A



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25. Two equal forces (P each) act at a point inclined to each other at an angle of 120° . The magnitude of their resultant is

A. $P/2$

B. $P/4$

C. P

D. $2P$

Answer: C



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26. Threshold wavelength for photoelectric emission from a metal surface is 5200 Å. Photoelectrons will be emitted when this

surface is illuminated with monochromatic radiation from

- A. 1 W IR lamp
- B. 50 W UV lamp
- C. 50 W IR lamp
- D. 10 W IR lamp.

Answer: B



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27. The emitter-base junction of a transistor is _____ biased while the collector-base junction is _____ biased.

A. forward, forward

B. forward, reverse

C. reverse, forward

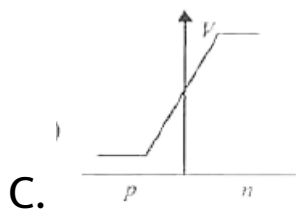
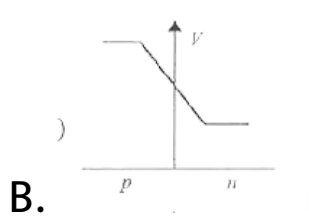
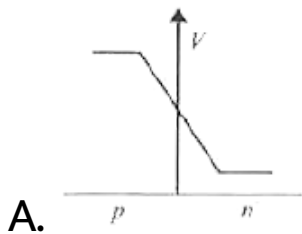
D. reverse, reverse

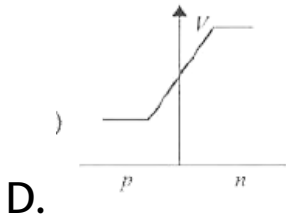
Answer: B



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28. In a forward biased p-n junction diode, the potential barrier in the depletion region is of the form





Answer: D

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29. A cylinder of radius r and length l is placed in an uniform electric field E parallel to the axis of the cylinder. The total flux for the surface of the cylinder is given by

A. *zero*

B. $2\pi r^2 E$

C. $\pi r^2 E$

D. $(\pi r^2 + \pi l^2) E$

Answer: A



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30. Two electric bulbs A and B are rated as 60 W and 100 W. They are connected in parallel to the same source. Then

A. B draws more current than A

B. current drawn are in the ratio of their resistances

C. both draw the same current

D. A draws more current than B

Answer: A



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31. A thin plano-convex lens acts like a concave mirror of focal length 0.2 m when silvered from its plane surface. The refractive index of the material of the lens is 1.5. The radius of curvature of the convex surface of the lens will be

A. 0.1m

B. 0.75m

C. 0.4m

D. 0.2m

Answer: D



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32. The physical quantity having the same dimensions as Planck's constant is

- A. linear momentum
- B. angular momentum
- C. Boltzmann constant
- D. force

Answer: B



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33. A balloon is rising vertically up with a velocity of 29 ms^{-1} . A stone is dropped from it and it reaches the ground in 10 seconds. The height of the balloon when the stone was dropped from it is

A. 400m

B. 150m

C. 100m

D. 200m

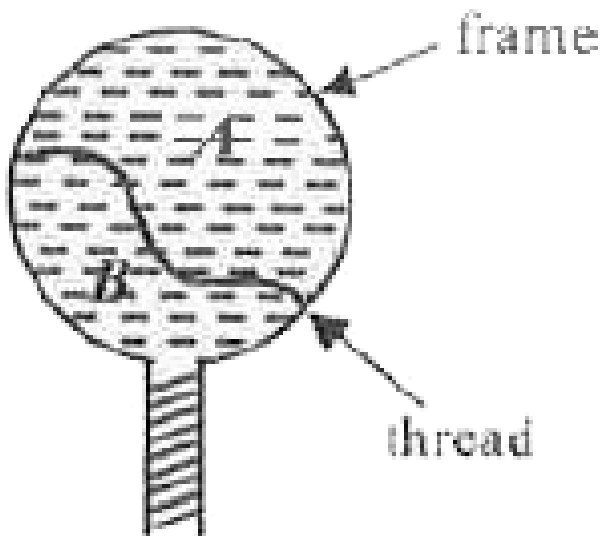
Answer: D



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34. A thread is tied slightly loose to a wire frame as in figure and the frame is dipped into a soap solution and taken out. The frame is completely covered with thread the film. When the portion A is punctured with a pin, the

thread



A. becomes concave towards A

B. become convex towards A

C. either (a) or (b) depending on the size of

A with respect to B

D. remains in the initial position.

Answer: C



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35. Oxygen is 16 times heavier than hydrogen.

Equal volumes of hydrogen and oxygen are

mixed. The ratio of speed of sound in the

mixture to that in hydrogen is

A. $\sqrt{8}$

B. $\sqrt{2/17}$

C. $\sqrt{1/8}$

D. $\sqrt{32/17}$

Answer: B



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36. If two waves of the same frequency and amplitude respectively on superposition produce a resultant disturbance of the same amplitude the waves differ in phase by

A. π

B. zero

C. $\pi / 3$

D. $2\pi / 3$

Answer: D



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37. A man, standing between two cliffs, claps his hands and starts hearing a series of echoes at intervals of one second. If the speed

of sound in air is 340 ms^{-1} , the distance between the cliff is

A. 680m

B. 1700m

C. 340m

D. 1620m

Answer: C



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38. A beam of light of wavelength 600 nm from a distant source falls on a single slit 1 mm wide and the resulting diffraction pattern is observed on a screen 2m away. The distance between the first dark fringes on either side of the central bright fringe is

A. 2.4cm

B. 2.4mm

C. 1.2mm

D. 1.2cm

Answer: B



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39. Specific rotation of sugar solution is $0.01SI$ units. $200kg - m^{-3}$ of impure sugar solution is taken in a polarimeter tube of length $0.25m$ and an optical rotation of 0.4 rad is observed. The percentage of purity of sugar in the sample is

A. 0.11

B. 0.2

C. 0.8

D. 0.89

Answer: C



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40. An electron is accelerated through a potential difference of 45.5 volt. The velocity acquired by it is (in ms^{-1})

A. 10^6

B. zero

C. 4×10^6

D. 4×10^4

Answer: C



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41. An unknown resistance R_1 is connected in series with a resistance of 10ohm . This combination is connected to one gap of meter

bridge while a resistance R_2 is connected in other gap. The balance point is at 50cm . Now, when the 10ohm resistance is removed balance point shifts to 40cm . The value of R_1 is (in ohm)

A. 20

B. 10

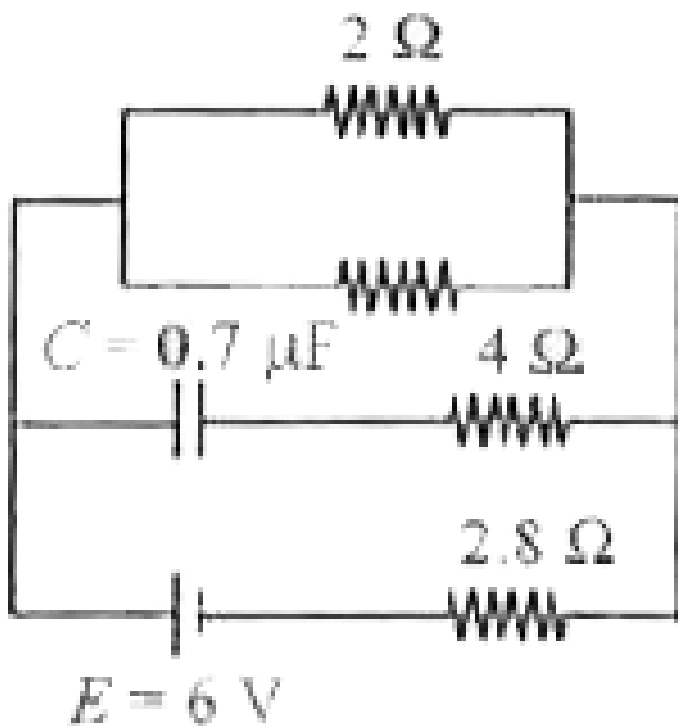
C. 60

D. 40

Answer: A



42. In the circuit shown, the internal resistance of the cell is negligible. The steady state current in the 2Ω resistor is



A. 0.6A

B. 1.2A

C. 0.9A

D. 1.5A

Answer: C



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43. A rectangular coil of 300 turns has an average area of $25\text{cm} \times 10\text{cm}$. The coil rotates with a speed of 50 cps in uniform magnetic

field of strength 4×10^{-2} About an axis perpendicular to the field. The peak value of the induced emf is (in volt)

A. 300π

B. 3000π

C. 3π

D. 30π

Answer: D



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44. In a LCR series circuit, the potential difference between the terminals of the inductance is 60 V, between the terminals of the capacitor is 30 V and that across the resistance is 40 V. Then, the supply voltage will be equal to

A. 130V

B. 10V

C. 50V

D. 70V

Answer: C



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45. A vertical circular coil of radius 0.1 m and having 10 turns carries a steady current. When the plane of the coil is normal to the magnetic meridian, a neutral point is observed at the centre of the coil. If $B_H = 0.314 \times 10^{-4} T$, the current in the coil is

A. 0.5A

B. 0.25A

C. 2A

D. 1A

Answer: A



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46. The spectrum obtained from the chromosphere of the sun at the time of total solar eclipse is

- A. line emission spectrum
- B. band emission spectrum
- C. continuous emission spectrum
- D. line absorption spectrum.

Answer: A



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47. Heavy water is

- A. compound of deuterium and oxygen

B. water at $4^{\circ}C$

C. water, in which soap does not lather

D. compound of heavy oxygen and heavy
hydrogen

Answer: A



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48. The nuclear reactor at Kaiga is a

A. research reactor

B. fusion reactor

C. breeder reactor

D. power reactor.

Answer: D



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49. When a body moves in a circular path, no work is done by the force since,

- A. force and displacement are perpendicular to each other
- B. the force is always away from the centre
- C. there is no displacement
- D. there is no net force.

Answer: A



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50. A bullet moving with a speed of 100m.s^{-1} can just penetrate two planks of equal thickness. Then, the number of such planks penetrated by the same bullet when the speed is doubled will be

A. 6

B. 10

C. 4

D. 8

Answer: D



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51. Two bodies of masses 1 kg and 2 kg have equal momentum. Then, the ratio of their kinetic energies is

A. 2 : 1

B. 3 : 1

C. 1 : 3

D. 1 : 1

Answer: A



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52. The loudness and the pitch of a sound depends on

- A. intensity and velocity
- B. frequency and velocity
- C. intensity and frequency
- D. frequency and number of harmonics.

Answer: C



53. Absorption co-efficient of an open window is...

A. 1

B. 0.25

C. zero

D. 0.5

Answer: C



54. In Melde's experiment in the transverse mode, the frequency of the tuning fork and the frequency of the waves in the strings are in the ratio

A. 2 : 1

B. 4 : 1

C. 1 : 1

D. 1 : 2

Answer: C



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55. The difference between the apparent frequency of a source of sound as perceived by the observer during its approach and recession is 2% of the frequency of the source. If the speed of sound in air is 300 m s^{-1} , the velocity of the source is

A. 1.5 m s^{-1}

B. 12 m s^{-1}

C. 6 m s^{-1}

D. $3ms^{-1}$

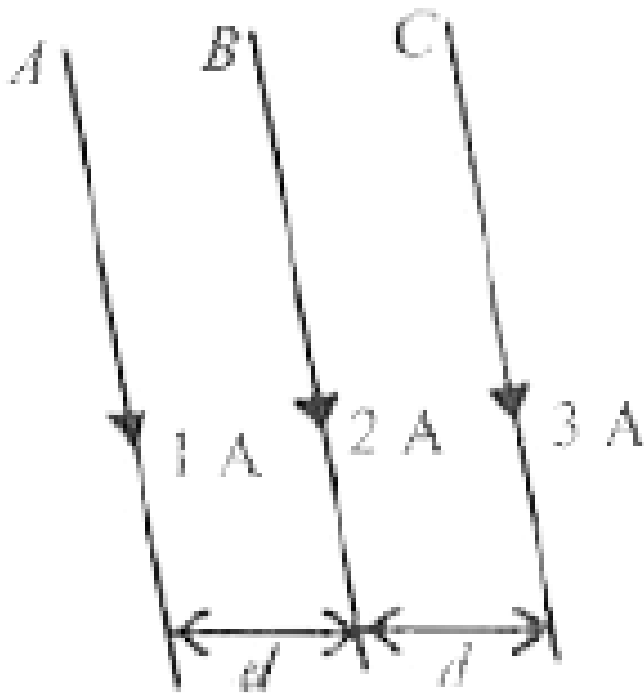
Answer: D



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56. Three long straight wires A , B and C are carrying currents as shown in figure. Then the

resultant force on B is directed



A. perpendicular to the plane of paper and
outward

B. perpendicular to the plane of paper and

inward

C. towards A

D. towards C

Answer: D



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57. Curie-Weiss law is obeyed by iron at a temperature....

A. at Curie temperature only

B. at all temperatures

C. below Curie temperature

D. above Curie temperature.

Answer: D



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58. The dimensional formula for inductance is

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

B. ML^2TA^{-2}

C. $ML^2T^{-1}A^{-2}$

D. $ML^2T^{-2}A^{-1}$

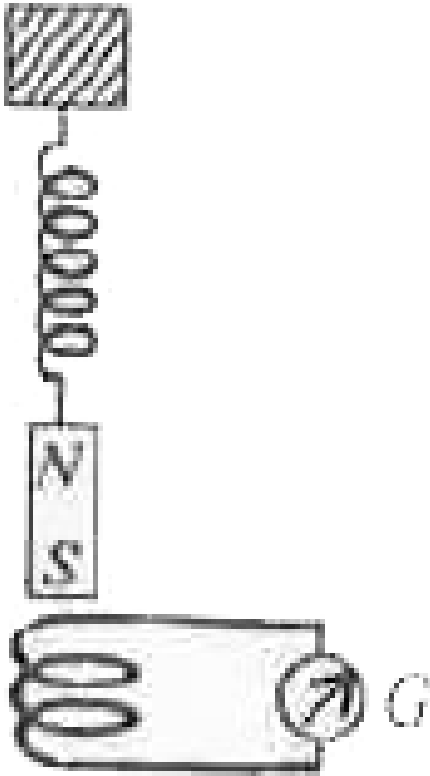
Answer: A



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59. A magnet NS is suspended from a spring and while it oscillates, the magnet moves in and out of the coil C. The coil is connected to A a galvanometer G. Then, as the magnet

oscillates,



A. G shows no deflection

B. G shows deflection to the left and right

but the amplitude steadily decreases

C. G shows deflection to the left and right

with constant amplitude

D. G shows deflection on one side.

Answer: B



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60. The maximum current that can be measured by a galvanometer of resistance 40 is 10 mA. It is converted into a voltmeter that can read upto 50 V. The resistance to be connected in series with the galvanometer is (in ohm)

A. 2010

B. 4050

C. 5040

D. 4960

Answer: D



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