PHYSICS

AAKASH INSTITUTE ENGLISH

Mock Test 29: PHYSICS

Example

1. The magnetic field dB due to a small element at a distance r and carrying current i is

A. $\overline{dB} = \frac{\mu_0}{4\pi} i \left(\frac{\overline{dl} \times \bar{r}}{r} \right)$

B. $\overline{dB} = \frac{\mu_0}{4\pi} i^2 \left(\frac{\overline{dl} \times \bar{r}}{r} \right)$

C. $\overline{dB} = \frac{\mu_0}{4\pi} i \left(\frac{\overline{dl} \times \bar{r}}{r^2} \right)$

D. $\overline{dB} = \frac{\mu_0}{4\pi} i \left(\frac{\overline{dl} \times \bar{r}}{r^3} \right)$

Answer: D

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2. a very long straight wire carries a current I.

at the instant when are charge -Q at point P

has velocity v as shown in figure the force on the charge is

A. opposite to OX

B. along OX

C. opposite to OY

D. along OY

Answer: C

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3. Two coils are having magnetic field B and 2B at their centres and current i and 2i then the ratio of their radius is

A. $1:2$

B. $2:1$

C. $1:1$

D. $4:1$

Answer: C

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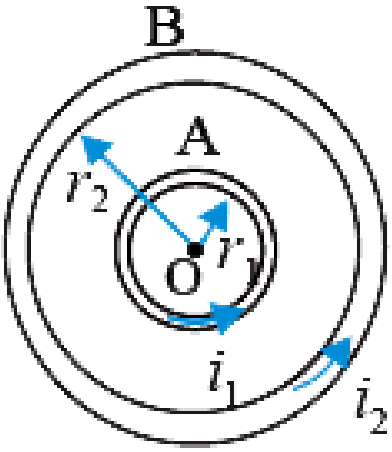
4. A and B are two concentric circular conductors of centre O and carrying currents i_1 and i_2 as shown in the figure. The ratio of their radii is $1:2$ and ratio of the flux densities at O due to A and B is $1:3$. The value of i_1/i_2 will be :



A. $\frac{1}{6}$

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

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

D. $\frac{1}{2}$

Answer: A

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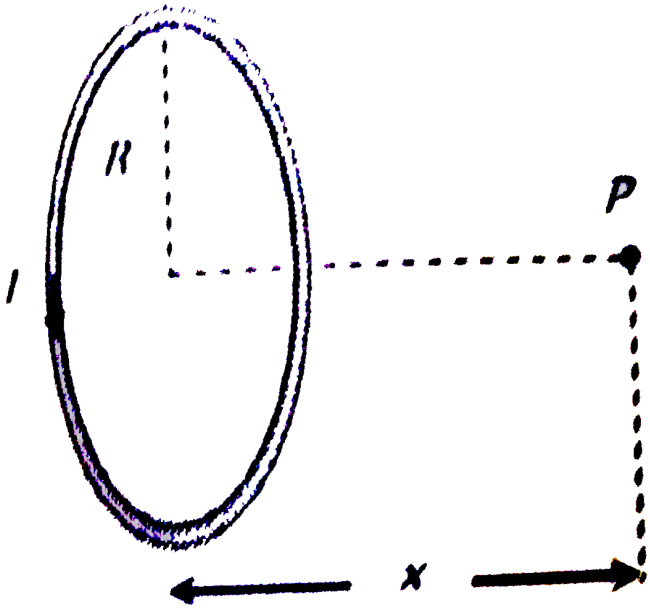
5. A coil having N turns carry a current I as shown in the figure. The magnetic field

intensity at point P is



A. $\mu_0 NI \frac{R^2}{\left(R^2+x^2\right)^3}/2$

B. $\mu_0 NI \frac{R^2}{\left(R^2+x^2\right)^1}/2$

C. $\mu_0 NI \frac{R^2}{2} \frac{\left(R^2+x^2\right)^3}{2}$

D. $\mu_0 NI2 \frac{R^2}{\left(R^2+x^2\right)^3}/2$

Answer: C

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6. a vertical wall is in South north direction. a current carrying where is kept in the world such that to the west of the wall magnetic field due to wire is towards south then the wire where should be

A. vertical and current in downwards

B. horizontal and current is toward West

C. vertical and current in upward

D. horizontal and current is towards east

Answer: C

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7. The expression for magnetic induction inside a solenoid of length L carrying a current I and having N number of turns is

A. $\mu_0 \frac{n}{4} \pi l$

B. $\mu_0 \frac{l}{4} \pi n$

C. $\frac{\mu_0}{4} \pi n l$

D. $\mu_0 n l$

Answer: D

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8. The current on the winding of a toroid is 2 A. It has 400 turns and mean circumferential length is 40 cm. With the help of search coil and charge measuring instrument the

magnetic field is found to be 1 T. The susceptibility is

A. 2000

B. 2500

C. 1000

D. 1500

Answer: B

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9. Two long parallel wires are at a distance 2d apart. They carry steady equal current flowing out of the plane of the paper as shown. The variation of the magnetic field along the line xx' is given by :

A.

B.

C.

D.

Answer: B

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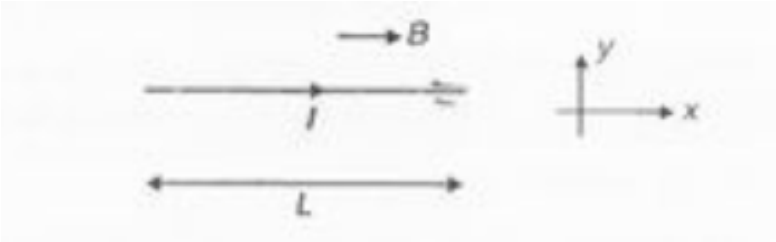
10. the force on current carrying wire placed in uniform magnetic field B as shown in figure is



A. $BIL\left(-\hat{j}\right)$

B. $BIL\left(\hat{j}\right)$

C. $BIL\left(-\hat{i}\right)$

D. Zero

Answer: D

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11. a straight wire current element is carrying current 100 A as shown in figure. the magnitude of magnetic field at a point P.

A. 5×10^{-3} T

B. 2.5×10^{-6} T

C. 0.8×10^{-5} T

D. 5×10^{-6} T

Answer: D

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12. A long thick conducting cylinder of radius 'R' carries a current uniformly distributed over its cross section :

A. the magnetic field strength is maximum on the surface

B. the strength of the magnetic field inside the conductor will vary as inversely

proportional to r where r is the distance from the axis.

C. the strength of the magnetic field outside the conductor varies as inversely e proportional to 1/r^2 where r is the distance from the axis

D. both (2) & (3)

Answer: A

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13. in given figure X and Y are two long straight parallel conductor each carrying a current 2 A. the force per unit length on each conductor is F. when the current in each is changed to 1 A and reversed in direction. the force per unit length on each is now

A. $\frac{F}{4}$ and unchanged in direction

B. $\frac{F}{2}$ and reversed in direction

C. $\frac{F}{2}$ and changed in direction

D. $\frac{F}{4}$ and reversed in direction

Answer: A

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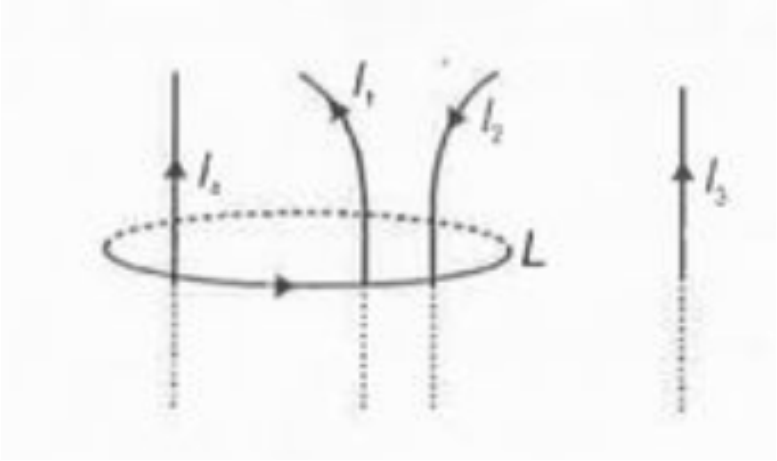
14. the value of $\oint \overline{B}.\overline{dl}$ for the loop L is



A. $\mu_0(l_1 + l_2 - l_4)$

B. $\mu_0(l_1 + l_2 - l_3 + l_4)$

C. $\mu_0(l_1 - l_2 + l_4)$

D. $\mu_0(l_1 + l_4 + l_3)$

Answer: C

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15. A current i flows along the length of an infinitely long, straight, thin-walled pipe. Then,

(a) the magnetic field at all points inside the pipe is the same, but not zero

(b) the magnetic field at any point inside the

pipe is zero

(c) the magnetic field is zero only on the axis of the pipe

(d) the magnetic field is different at different points inside the pipe

A. the magnetic field at all points inside the pipe is the same but not zero

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C. the magnetic field is zero only on the axis of the pipe

D. the magnetic field is different at different points inside the pipe

Answer: B

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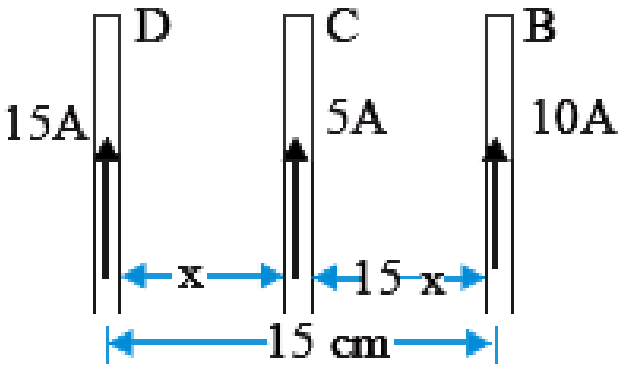
16. Three long, straight and parallel wires carrying currents are arranged as shown in the figure. The wire C which carries a current of 5.0 amp is so placed that it experiences no force. The distance of wire C from wire D is

then



A. 9 cm

B. 7 cm

C. 5 cm

D. 3 cm

Answer: A

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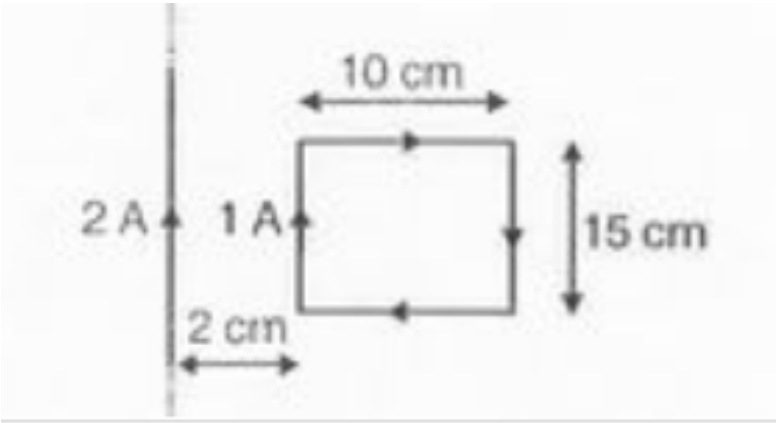
17. the net force on the loop is



A. 2.5×10^{-7} N away from wire

B. 37×10^{-7} N onwards wire

C. 25×10^{-7} N onwards wire

D. 3.7×10^{-7} N away from wire

Answer: C

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