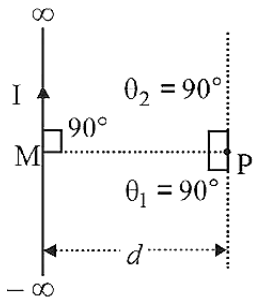
Prayas JEE (2025)

Physics

Magnetism

DPP: 1

Q1 Find magnetic field due to infinite length wire at point 'P'.



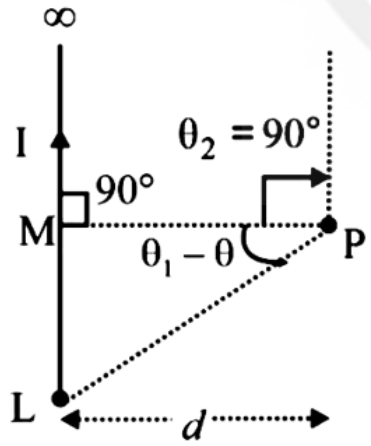
(A) $\frac{\mu_0 I}{2\pi d}$

(B) $\frac{\mu_0 2}{2\pi d}$

(C) $\frac{2\pi d}{\mu_0 2}$

(D) $\frac{\mu_0 2}{4\pi d}$

Q2 Find magnetic field due to given wire at point 'P'.



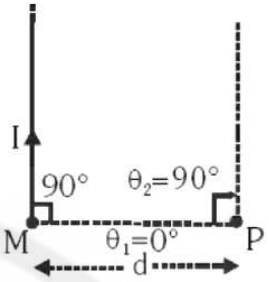
(A) $\frac{\mu_0 I}{4\pi d}[\sin\theta + 3]$

(B) $\frac{\mu_0 I}{4\pi d}[\sin\theta + 5]$

(C) $\frac{\mu_0 I}{4\pi d}(\text{Sin}\theta + 1)$

(D) None of these

Q3 Find magnetic field due to semi infinite length wire at point 'P'.



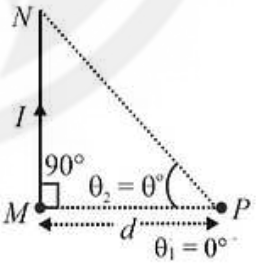
(A) $\frac{\mu_0 I}{5\pi d}$

(B) $\frac{\mu_0 I}{4\pi d}$

(C) $\frac{\mu_0 I}{3\pi d}$

(D) $\frac{\mu_0 I}{1\pi d}$

Q4 Find magnetic field due to finite length wire at point 'P'.



(A) $\frac{\mu_0 I}{8\pi d}\sin\theta$

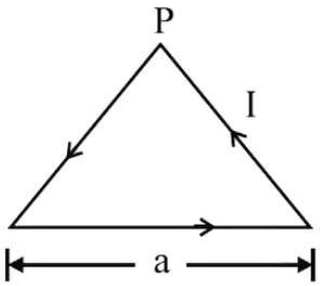
(B) $\frac{\mu_0 I}{6\pi d}\sin\theta$

(C) $\frac{\mu_0 I}{7\pi d}\sin\theta$

(D) $\frac{\mu_0 I}{4\pi d}\text{Sin}\theta$

Q5 An equilateral triangle of side a carries 'a' current 'I'. Magnetic field at point 'P' which is

vertex of triangle



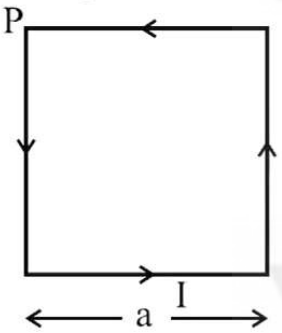
(A) $\frac{\mu_0 I}{2\sqrt{3}\pi a}\odot$

(B) $\frac{\mu_0 I}{2\sqrt{3}\pi a}\otimes$

(C) $\frac{9}{2}\left(\frac{\mu_0 I}{\pi a}\right)\odot$

(D) $\frac{9}{2}\left(\frac{\mu_0 I}{2\sqrt{3}\pi a}\right)\otimes$

Q6 A square loop of side 'a' is made by a current carrying wire. Magnetic field at its vertex 'P' is



(A) $\frac{\mu_0 I}{2\sqrt{2}\pi a}\odot$

(B) $\frac{\mu_0 I}{2\sqrt{2}\pi a}\otimes$

(C) $2\sqrt{3}\frac{\mu_0 I}{\pi a}\otimes$

(D) $2\sqrt{2}\frac{\mu_0 I}{\pi a}\odot$

Q7 Radius of current carrying coil is $'\mathrm{R}'$. Then ratio of magnetic fields at the centre of the coil to the axial point, which is $\mathrm{R}\sqrt{3}$ distance away from the centre of the coil :-

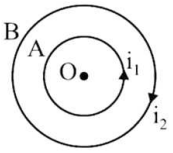
(A) $1:1$

(B) $1:2$

(C) $1:4$

(D) $8:1$

Q8 A and B are two concentric circular loop carrying current i1 and i2 as shown in figure. If ratio of their radii is $1:2$ and ratio of the flux densities at the centre O due to A and B is $1:3$ then the value of $\frac{i_1}{i_2}$ will be



(A) $\frac{1}{2}$

(B) $\frac{1}{3}$

(C) $\frac{1}{4}$

(D) $\frac{1}{6}$

Q9 A circular coil of radius R carries an electric current. The magnetic field due the coil at a point on the axis of the coil located at a distance r from the center of the coil, such that $r >> R$ varies as :-

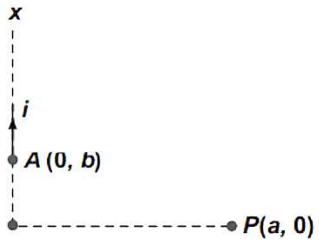
(A) $1/\mathrm{r}$

(B) $1/r^{3/2}$

(C) $1/\mathrm{r}^2$

(D) $1/r^3$

Q10 An infinitely long wire carrying current i is along Y-axis such that its one end is at point $(0, b)$ while the wire extends upto ∞. The magnitude of magnetic field strength at point $P(a, 0)$ is



(A) $\frac{\mu_0 i}{4\pi a}\left(1+\frac{b}{\sqrt{a^2+b^2}}\right)$

(B) $\frac{\mu_0 i}{4\pi a}\left(1-\frac{b}{\sqrt{a^2+b^2}}\right)$

(C) $\frac{\mu_0 i}{4\pi a}\left(1-\frac{a}{\sqrt{a^2+b^2}}\right)$

(D) $\frac{\mu_0 i}{4\pi a}\left(1+\frac{a}{\sqrt{a^2+b^2}}\right)$

Answer Key

Q1	A	Q6	A
Q2	C	Q7	D
Q3	B	Q8	D
Q4	D	Q9	D
Q5	A	Q10	B

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