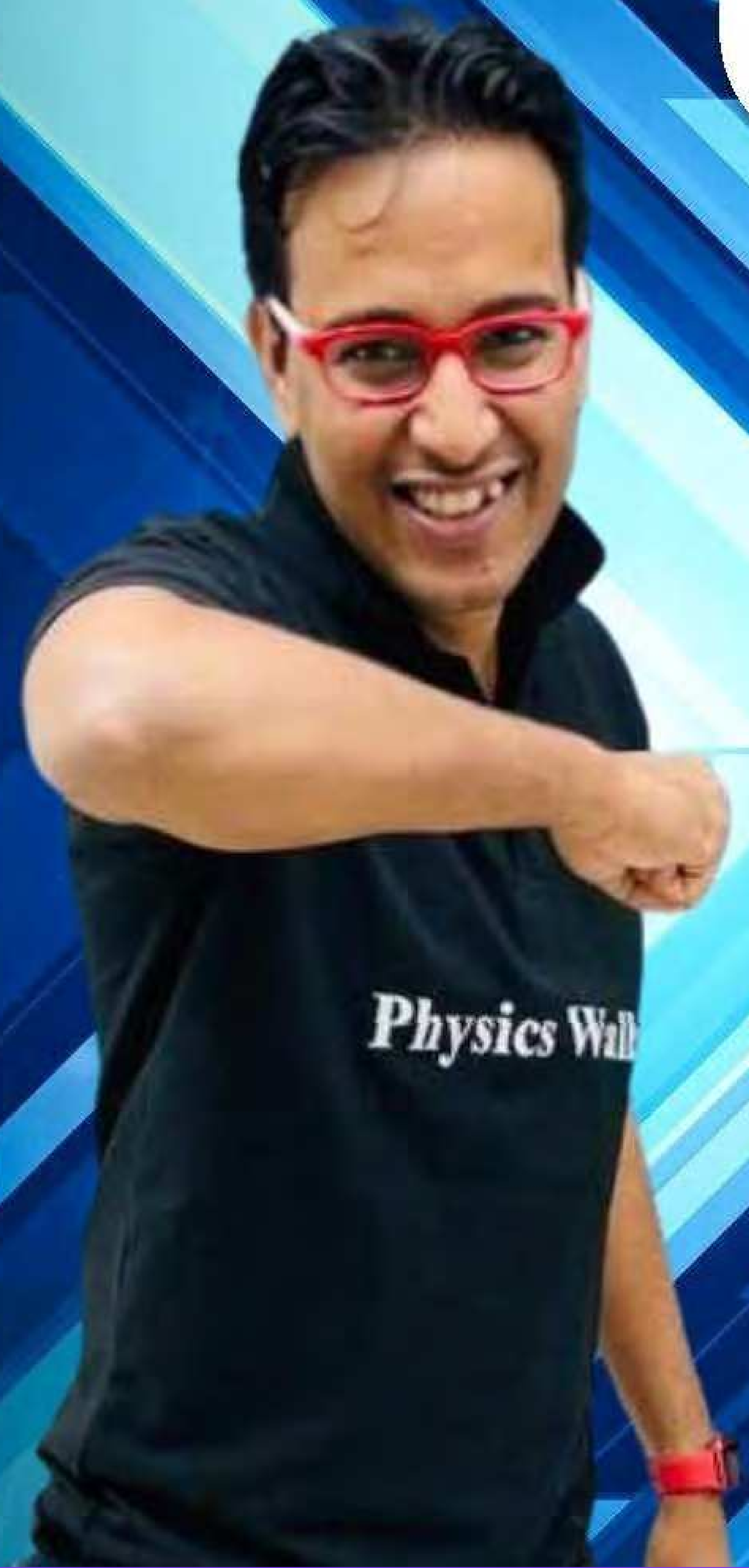
PRAYAS

JEE 2025

Lecture - 03 | Physics

Magnetism

By- Saleem Ahmed Sir



Topics *to be covered*

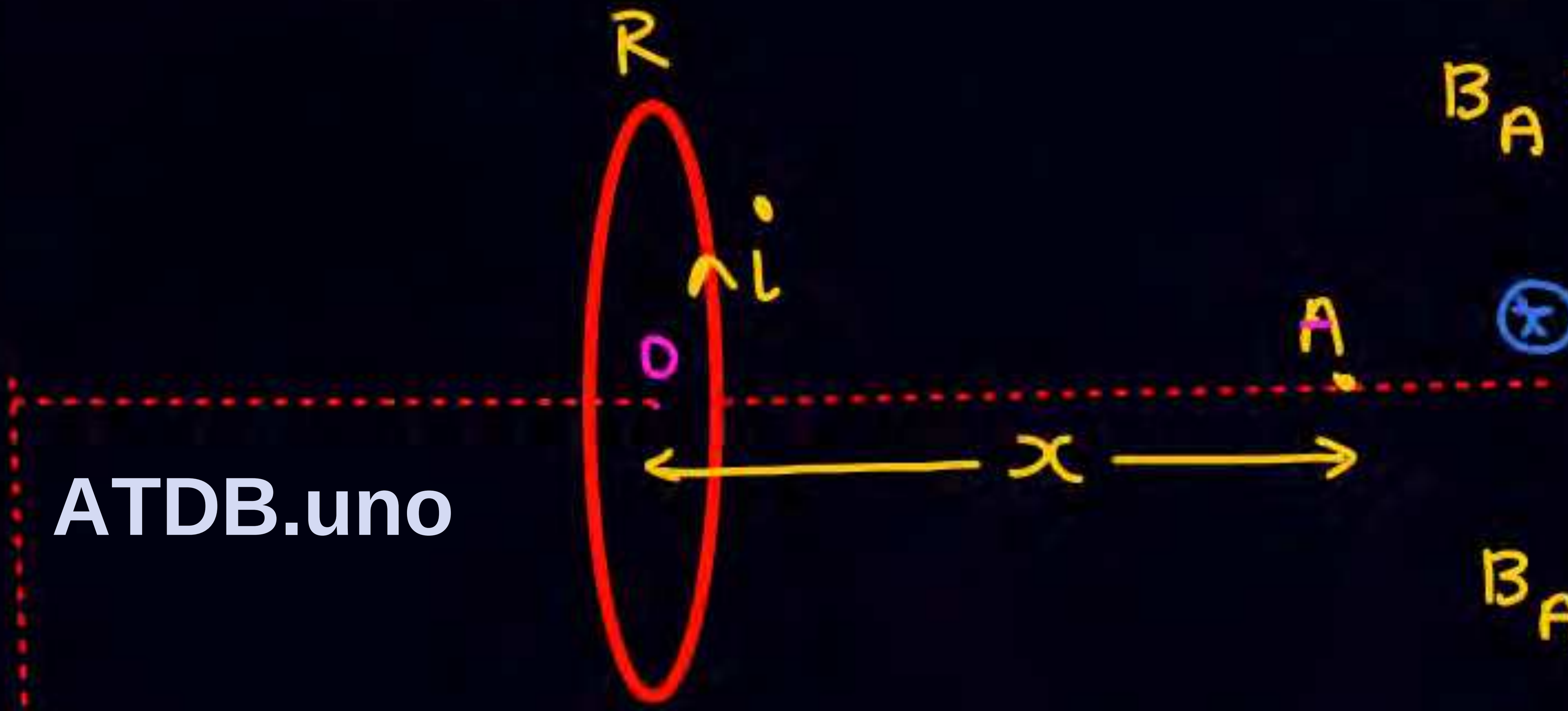
1. Ampere Law & Application

2. Magnetic Field Due to Hollow Cylinder (Long)
3. Magnetic Field Due to Solid Cylinder (Long)
4. Magnetic Field Due to Solenoid, Toroid, ∞ Sheet

$$B_{center} = \frac{\mu_0 i}{2R}$$

N no. of turn $\Rightarrow$ $B_{center} = \frac{\mu_0 i}{2R} N$

magnetic field due to current carrying loop at a point on the Axis

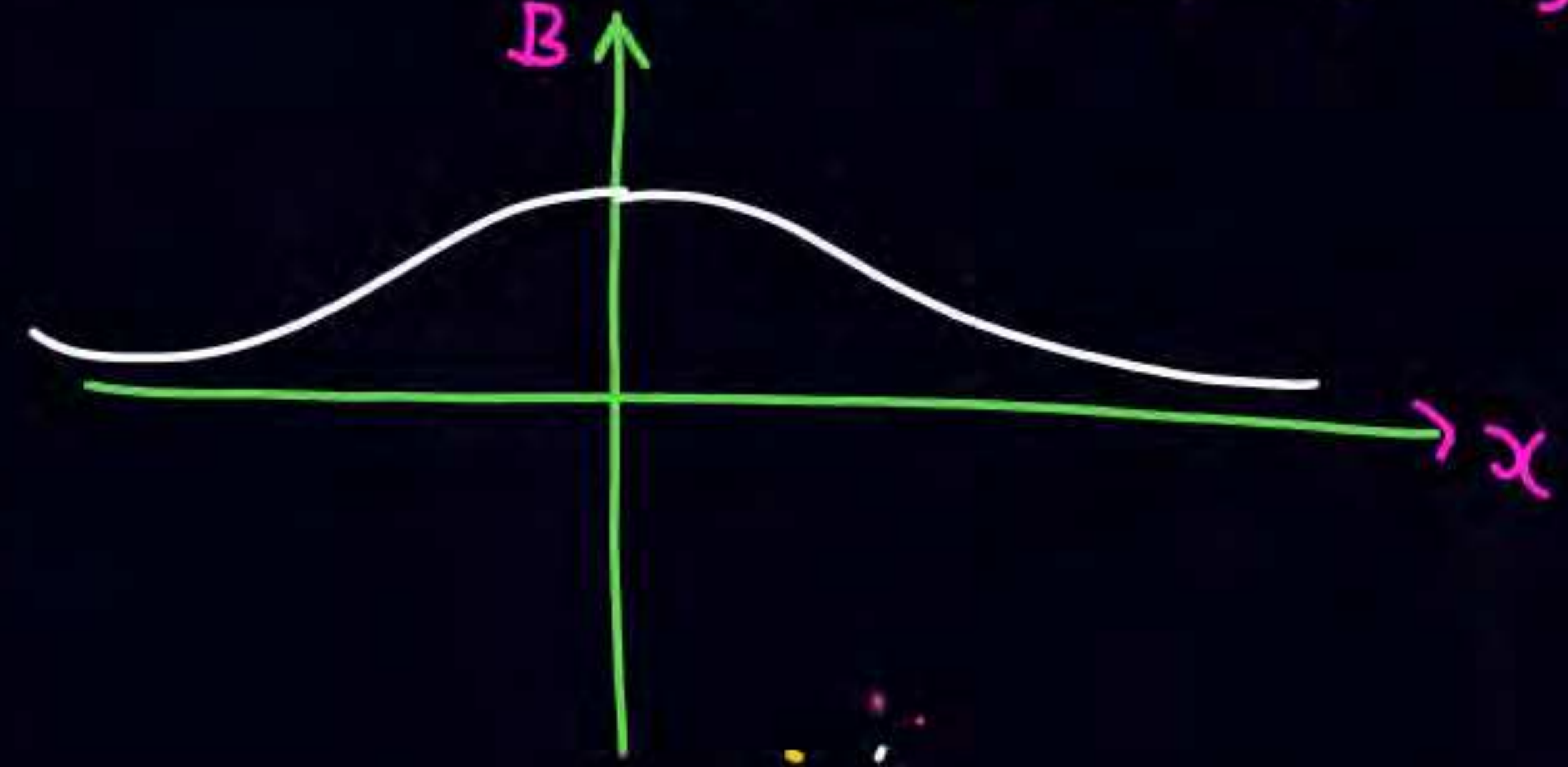


$$B_A = \frac{\mu_0 i R^2}{2(R^2+x^2)^{3/2}}$$

⊛ If N ⟶ no. of turns

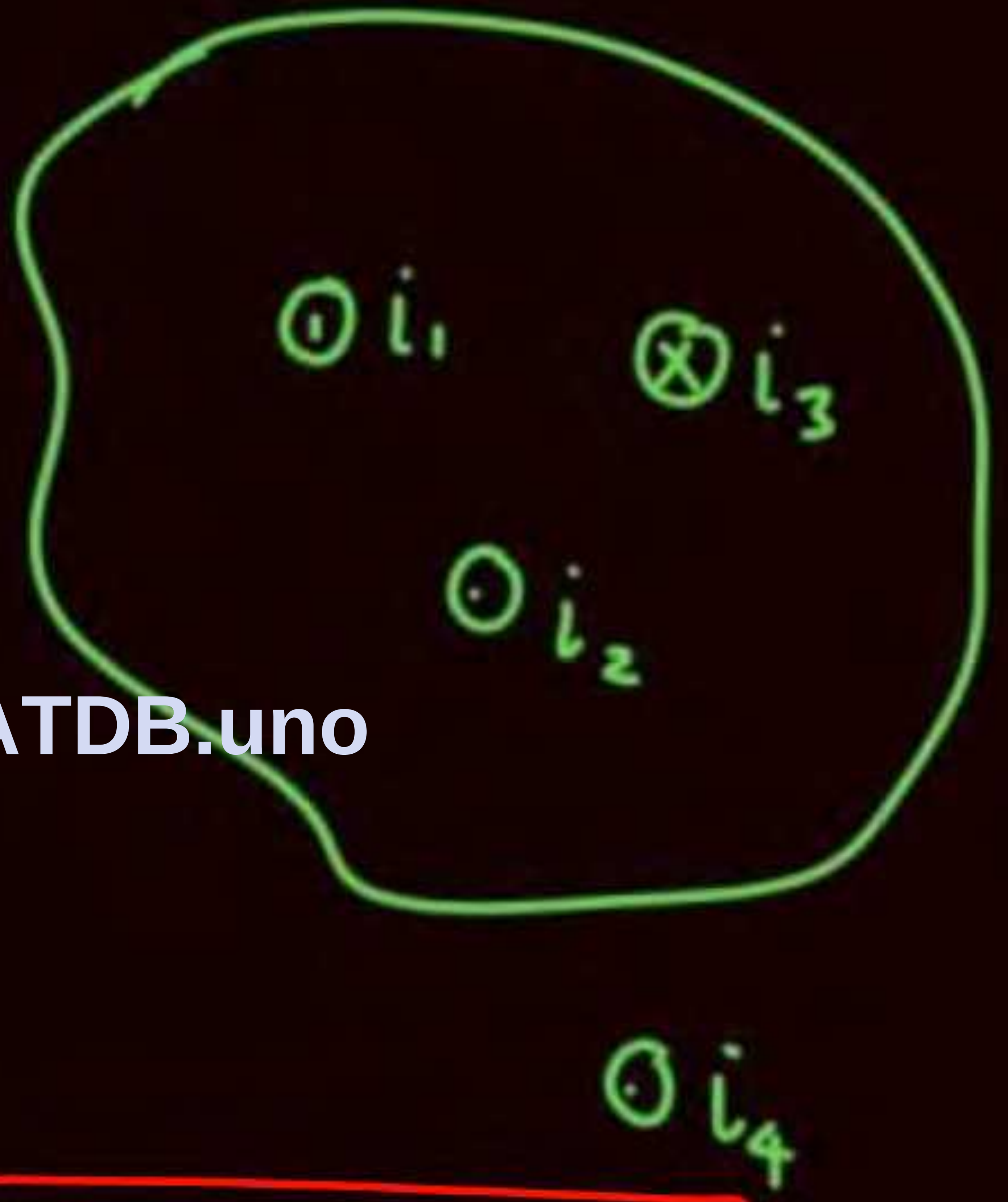
$$B_A = \frac{\mu_0 i R^2 . N}{2(R^2+x^2)^{3/2}}$$

** at center $x = 0$ $\Rightarrow$ $B_{center} = \frac{\mu_0 i}{2R} . N$



Ampere Law.

- The line integral of magnetic field over close loop ($\oint \vec{B}\cdot d\vec{l}$) is equal to the μ_0 times of sum of current crossing that loop.



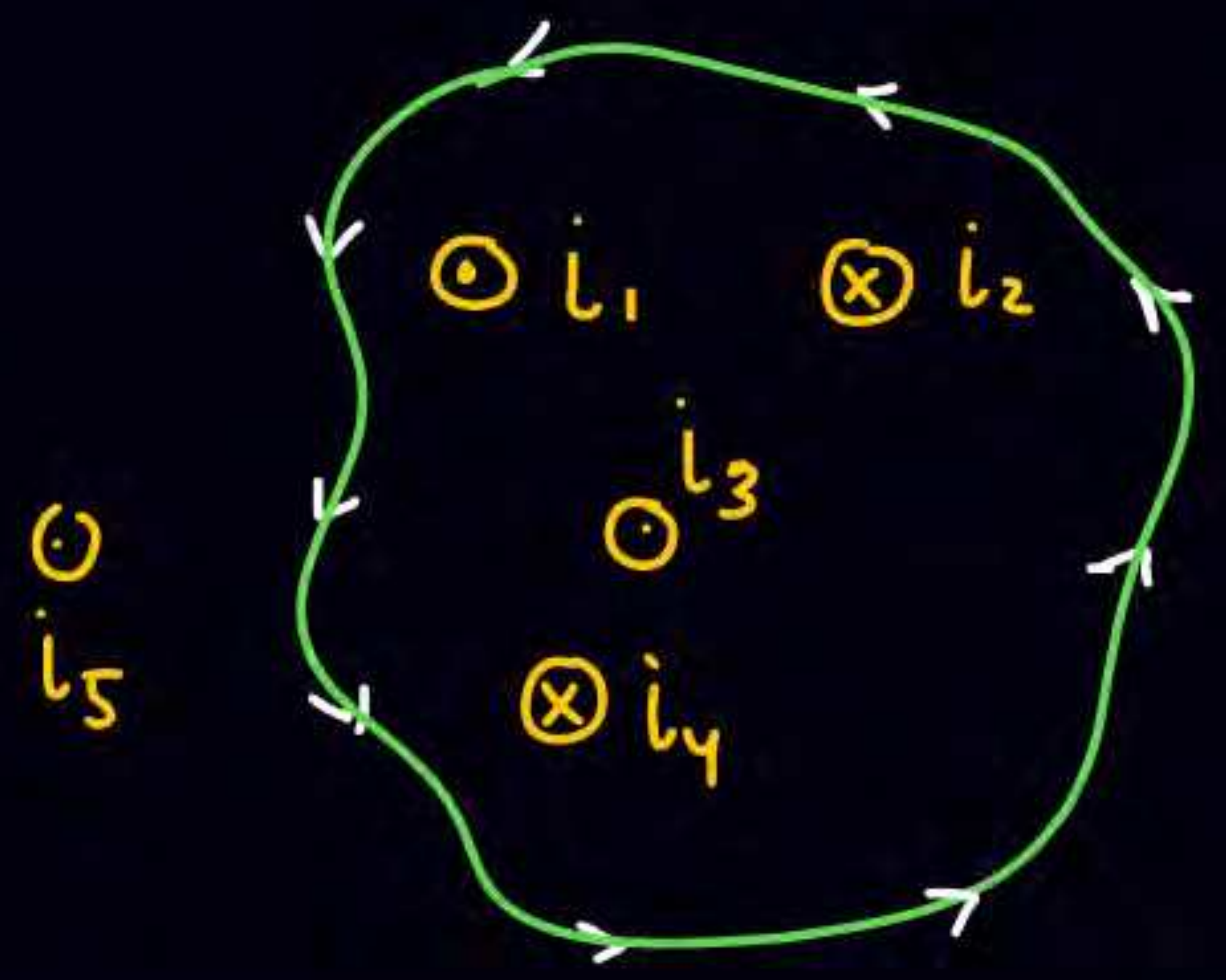
$$\oint \vec{B}\cdot d\vec{l} = \mu_0 \, i_{enclose}$$

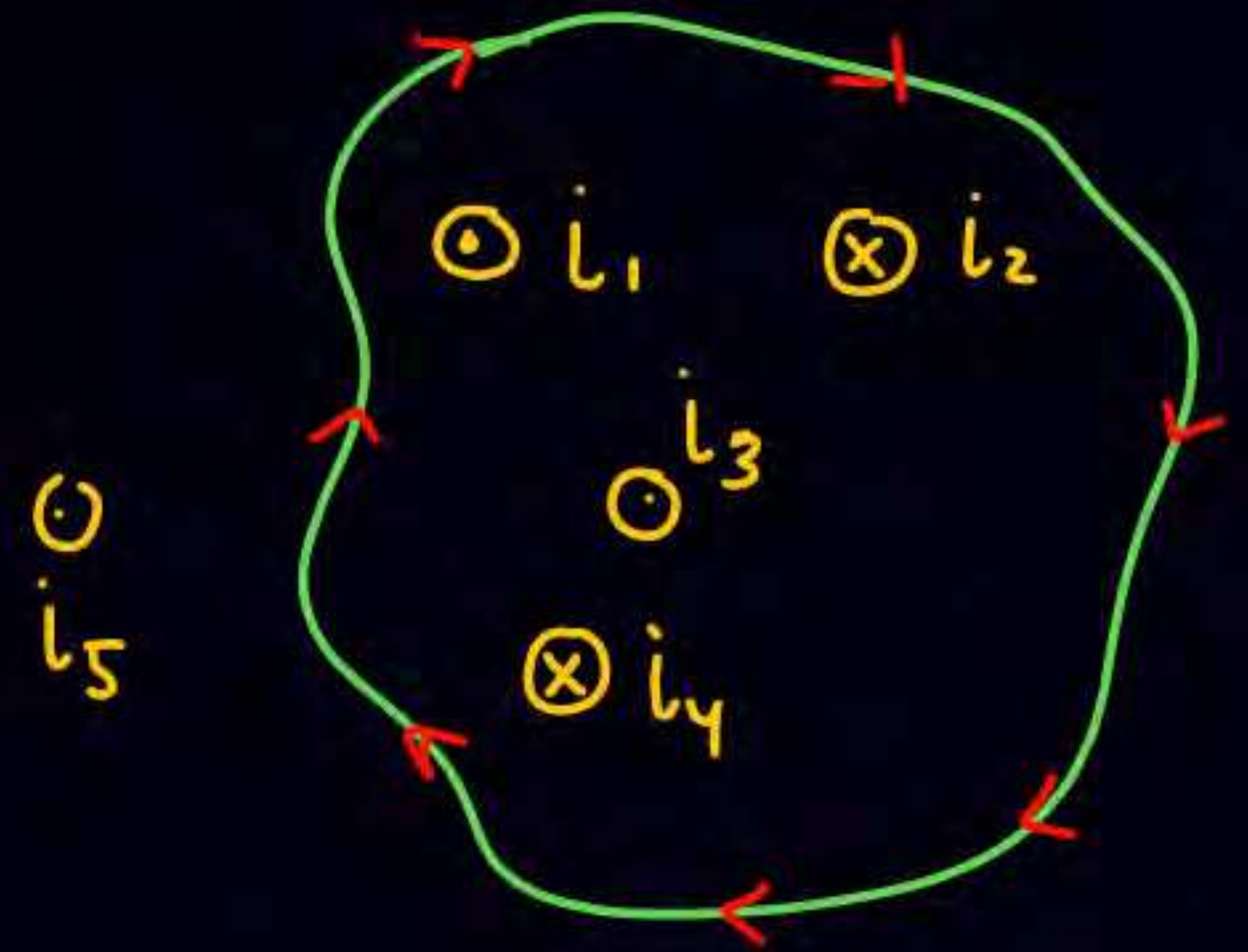
$$= \mu_0 \, i_{\text{अंदर}}$$

$\oint \vec{B}\cdot d\vec{l}$ ↓ (due to all the wire)

Gauss Law

$$\oint \vec{E}\cdot d\vec{A} = \frac{q_{in}}{\epsilon_0}$$





$$\oint \vec{B}\cdot d\vec{l} = \mu_0 (i_2 + i_4 - i_1 - i_3)$$

$$\oint \vec{B}\cdot d\vec{l} = \mu_0 i_{\text{अंदर}} = \mu_0 [i_1 - i_2 + i_3 - i_4]$$

Verification of Ampere Law

$$\oint \vec{B}\cdot d\vec{l} = \mu_0 i_{\text{अंदर}}$$

$$B(dl_1 + dl_2 + \cdots) = \mu_0 i$$

$$B\,2\pi r = \mu_0 i$$

$$B = \frac{\mu_0 i}{2\pi r} = \frac{2Ki}{r}$$

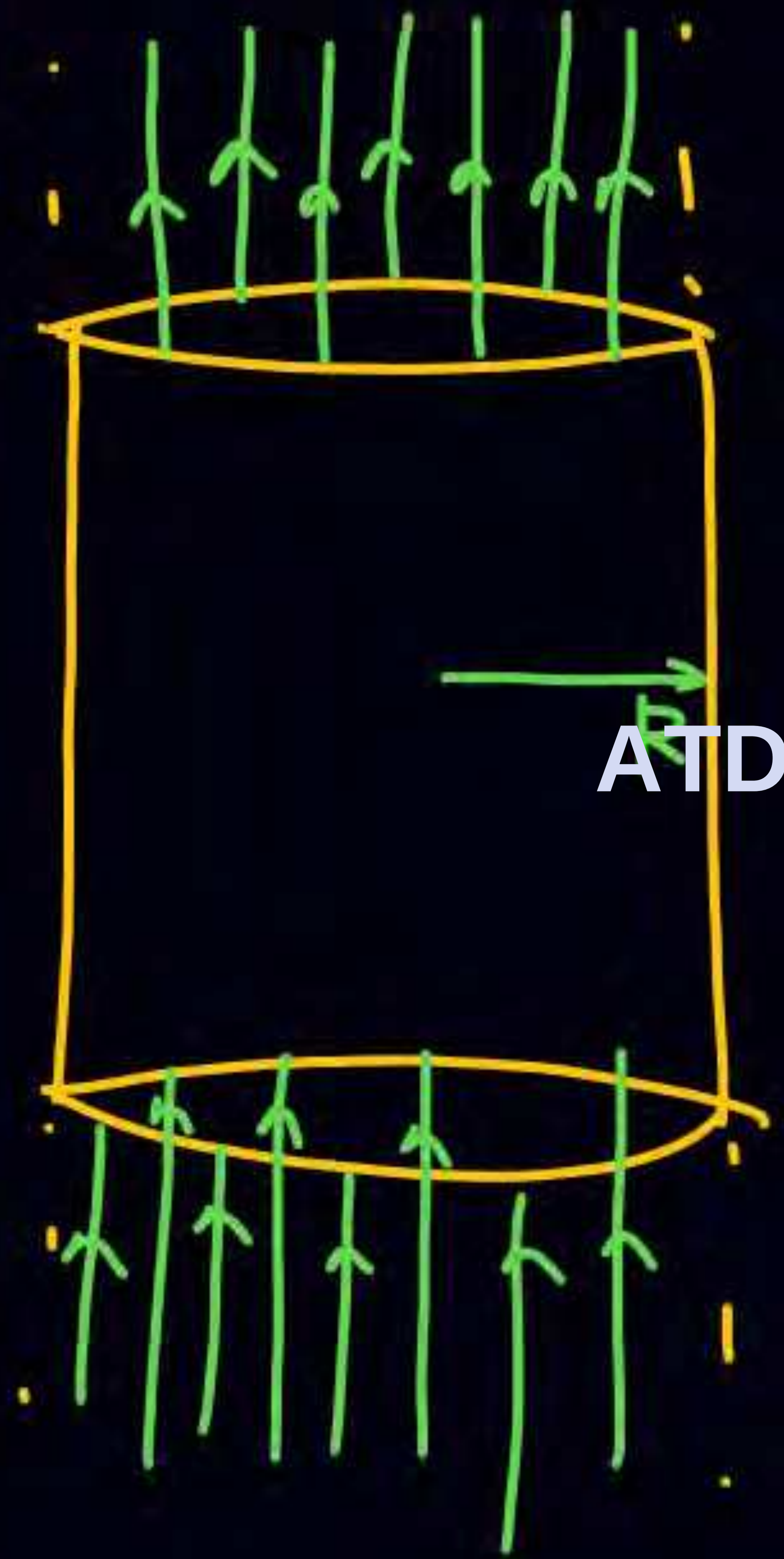
magnetic field due to long hollow cylinder

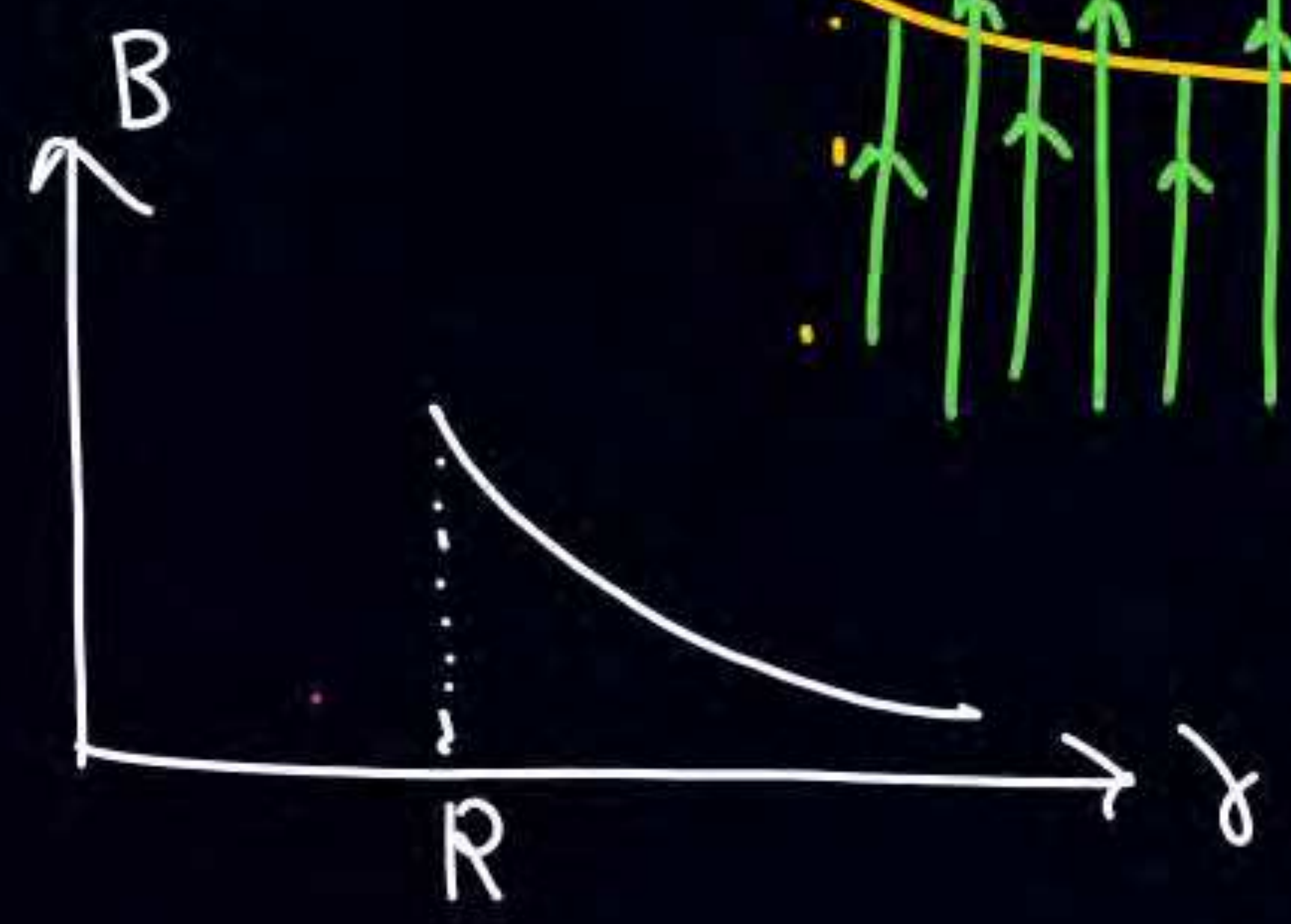
① Inside $(r<R)$

$$\oint \vec{B}\cdot d\vec{l} = \mu_0 i$$

$$B \cdot \oint dl = 0$$

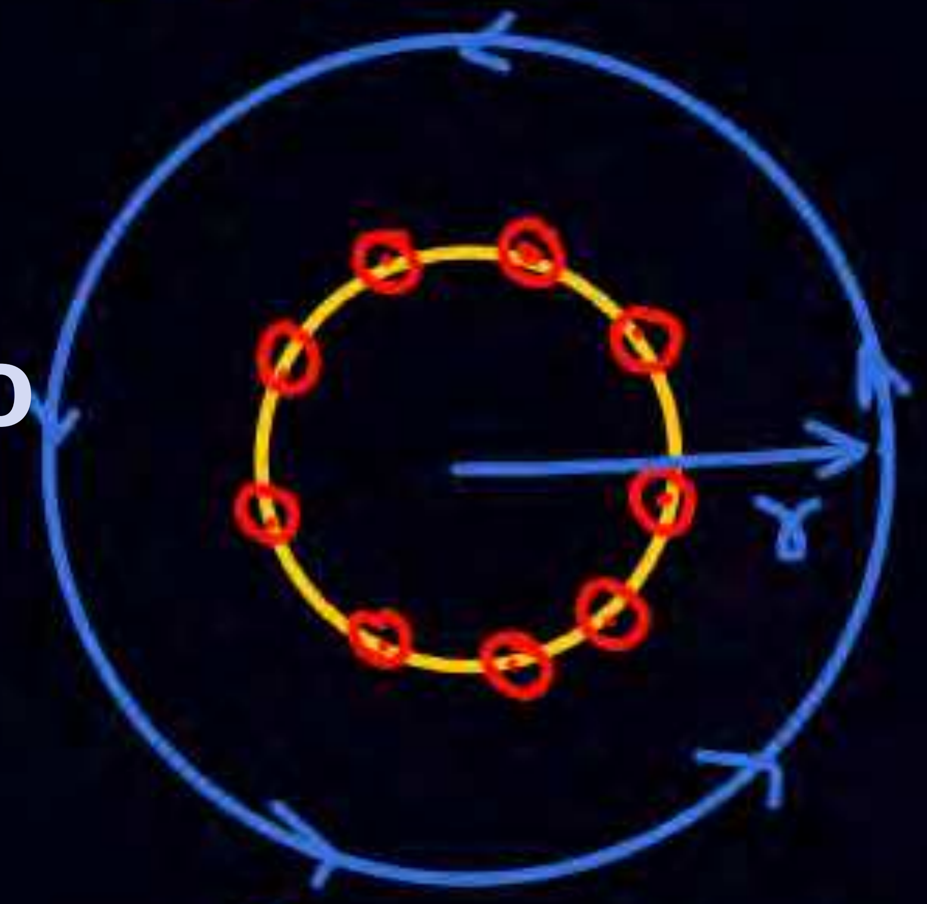
$$B = 0$$

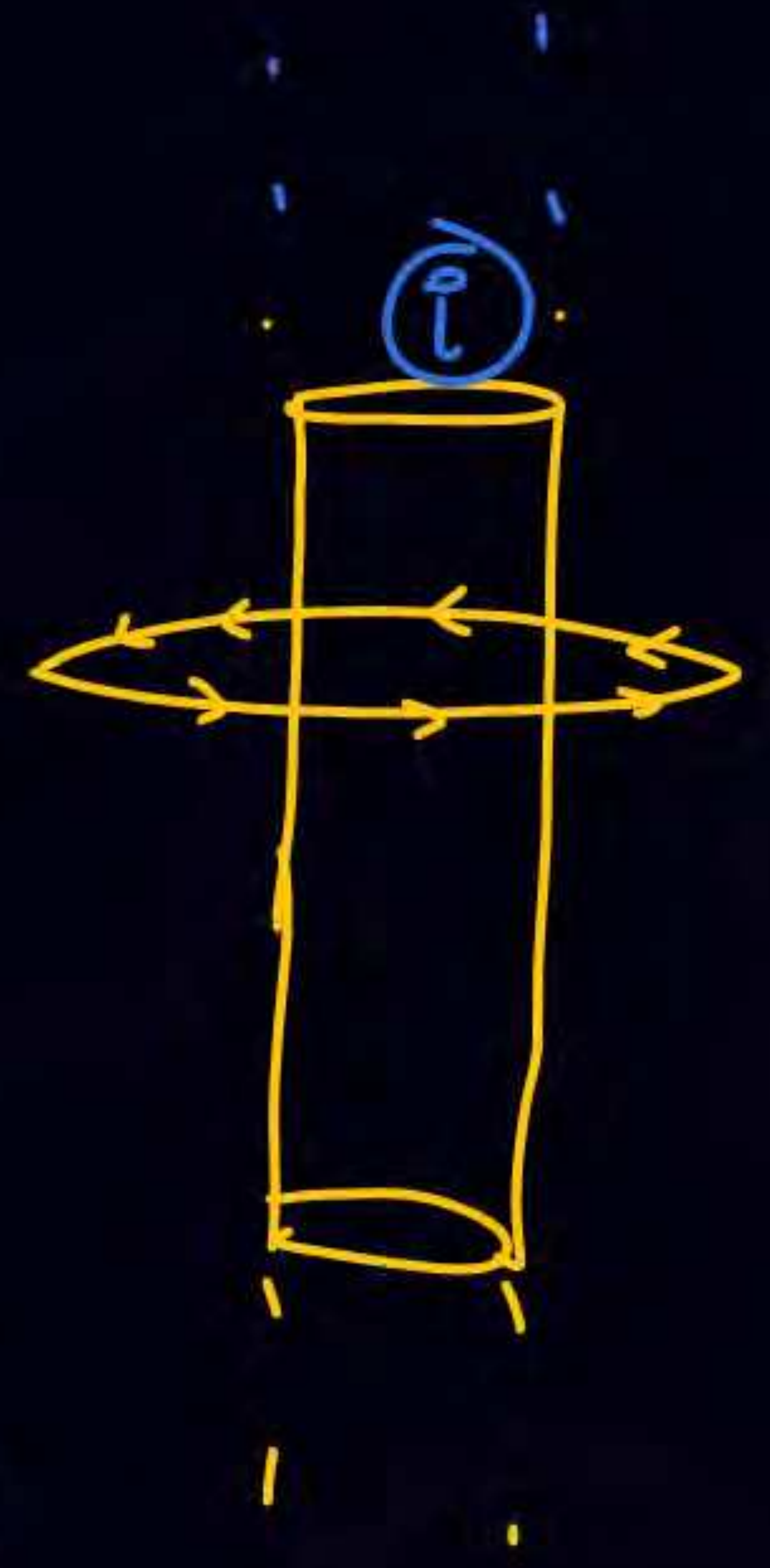




② outside $r>R$

top view





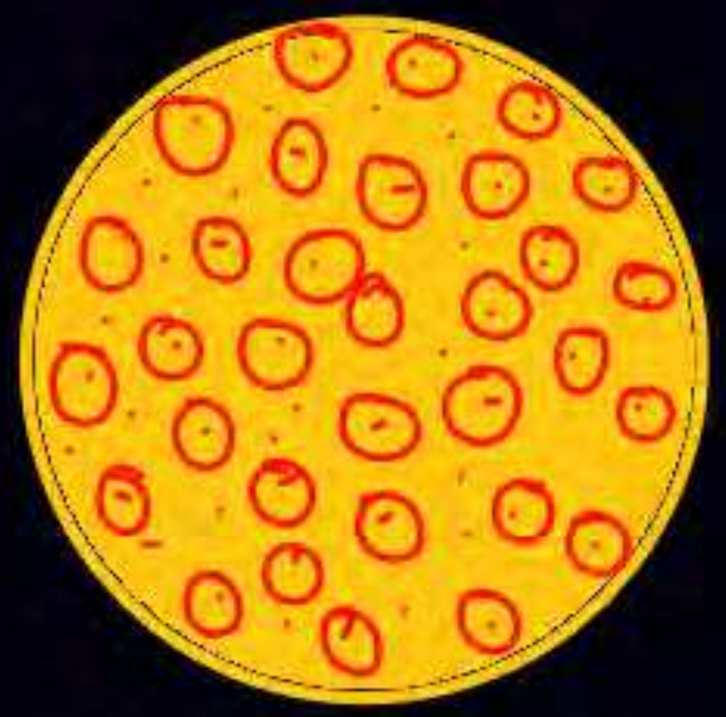
$$B \oint dl = \mu_0 i$$

$$B\, 2\pi r = \mu_0 i$$

$$B = \frac{\mu_0 i}{2\pi r} = \frac{2ki}{r}$$

Long solid cylinder (i, R)

top View

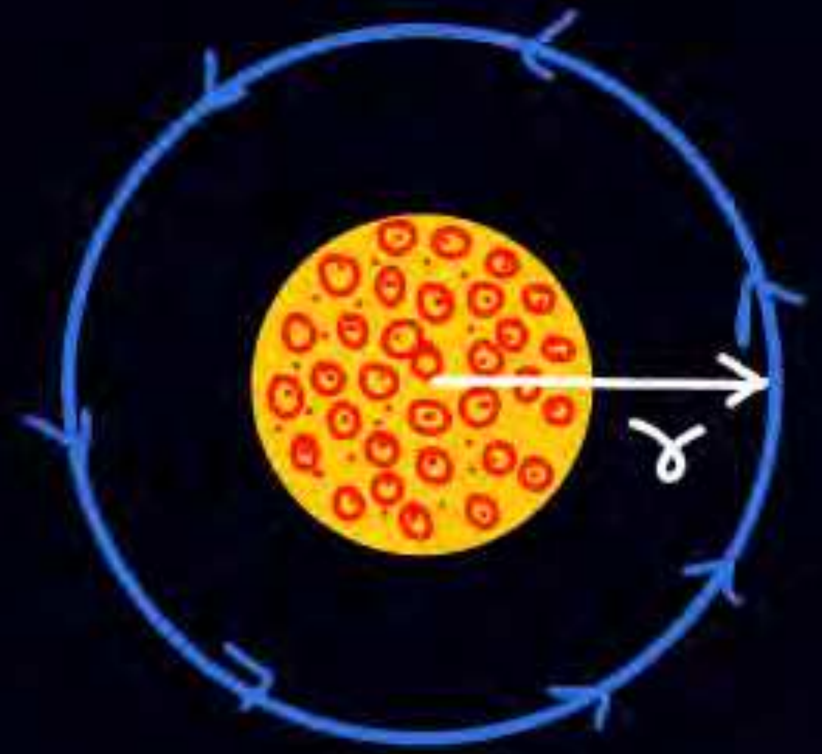


J = Current Density

$$J = \frac{i}{\pi R^2}$$

$$i = J \cdot \pi R^2$$

① Outside $(r > R)$



$$\oint \vec{B} \cdot d\vec{l} = \mu_0 i$$

$$B \int dl = \mu_0 i$$

$$B \, 2\pi r = \mu_0 i$$

$$B = \frac{\mu_0 i}{2\pi r} = \frac{2Ki}{r}$$

$$B \propto \frac{1}{r}$$

Long solid cylinder (i, R)

$(r<R)$ Inside

$B\,2\pi r = \mu_0 i_{\text{अंदर}}$

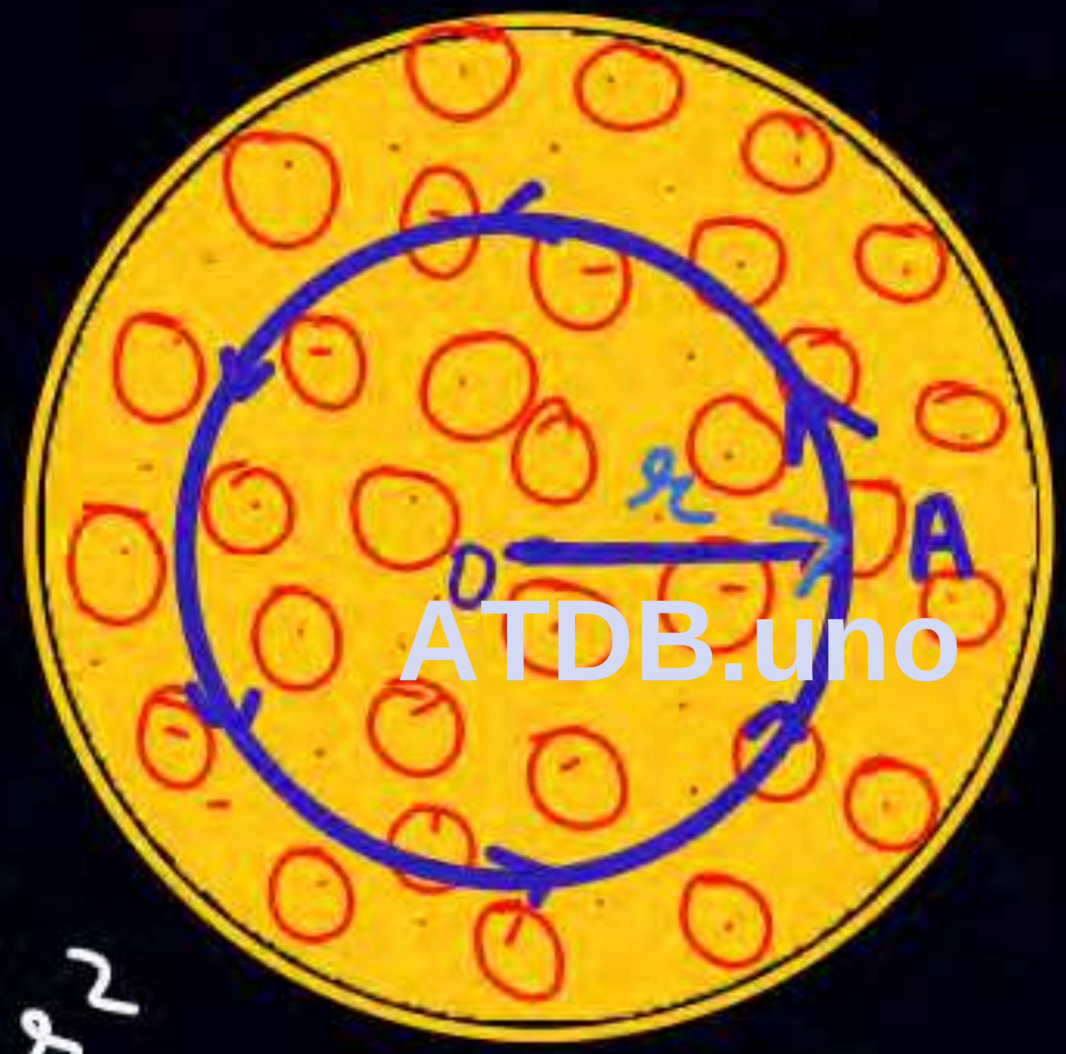
$\pi R^2 \longrightarrow i$

$1 \longrightarrow \frac{i}{\pi R^2}$

$\pi r^2 \longrightarrow \frac{i}{\pi R^2}\pi r^2 = \frac{i r^2}{R^2}$

$B\,2\pi r = \mu_0 \frac{i r^2}{R^2}$

$$\boxed{B = \frac{2kir}{R^2}}$$



At surface $B = \frac{\mu_0 J R}{2} = \frac{\mu_0 i}{2\pi R^2} R = \frac{\mu_0 i}{2R\pi} = \frac{2ki}{R}$

or

$B \cdot 2\pi r = \mu_0 (J \cdot \pi r^2)$

$$\boxed{B = \frac{\mu_0 J r}{2}}$$

$$\vec{B} = \frac{\mu_0 \vec{J} \times \vec{r}}{2}$$

At surface
$r = R$
$B = \mu_0 J R/2$

Solid cylinder Long

(1) $B_{inside} = \frac{2ki r}{R^2}$

$= \frac{\mu_0 J r}{2}$

(2) $B_{at\ surface}$ $(r = R)$

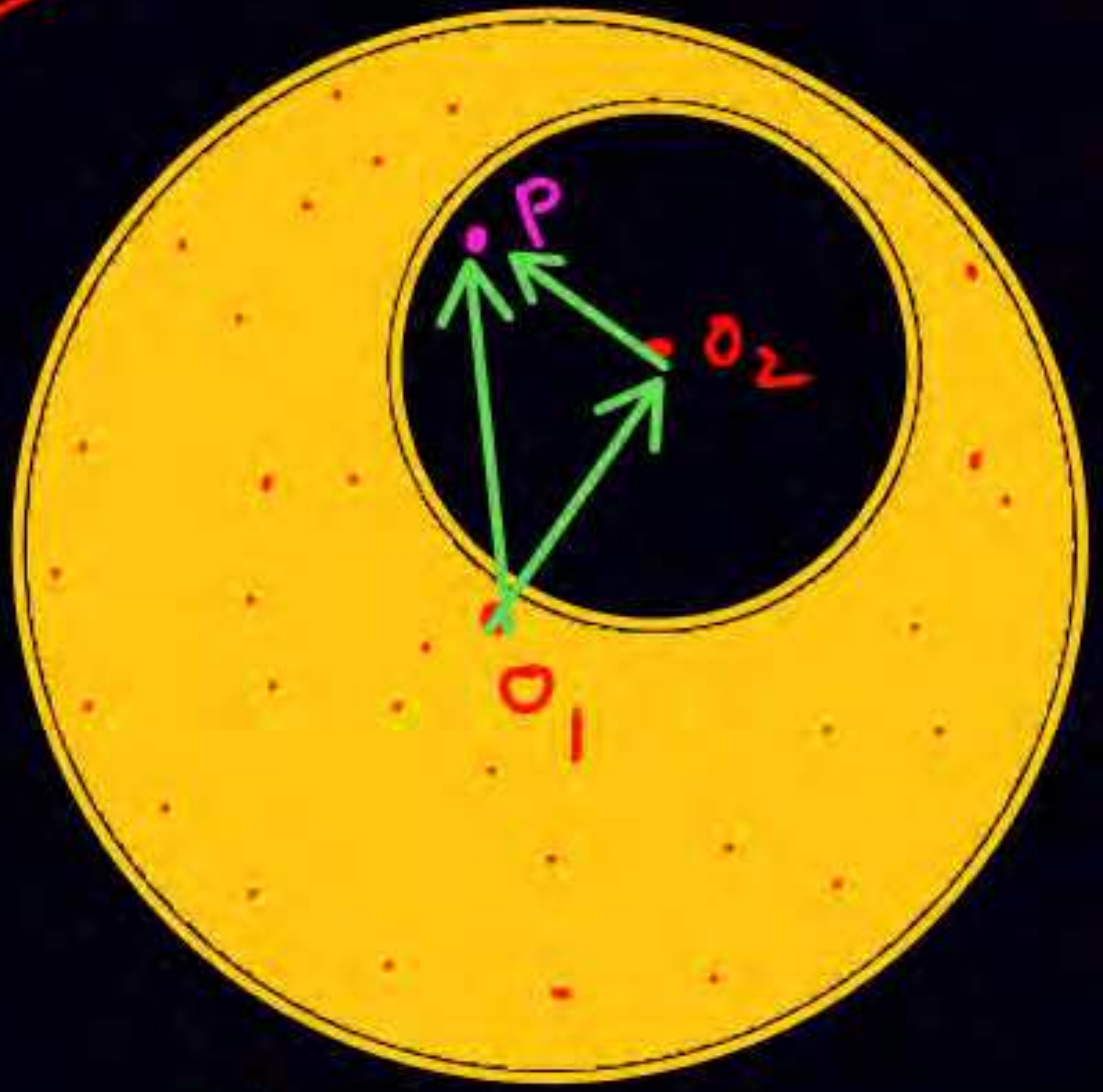
$B_{surf} = \frac{2ki}{R}, \frac{\mu_0 J R}{2}$

(3) outside

$B = \frac{2ki}{r}$

B inside cavity

Top View



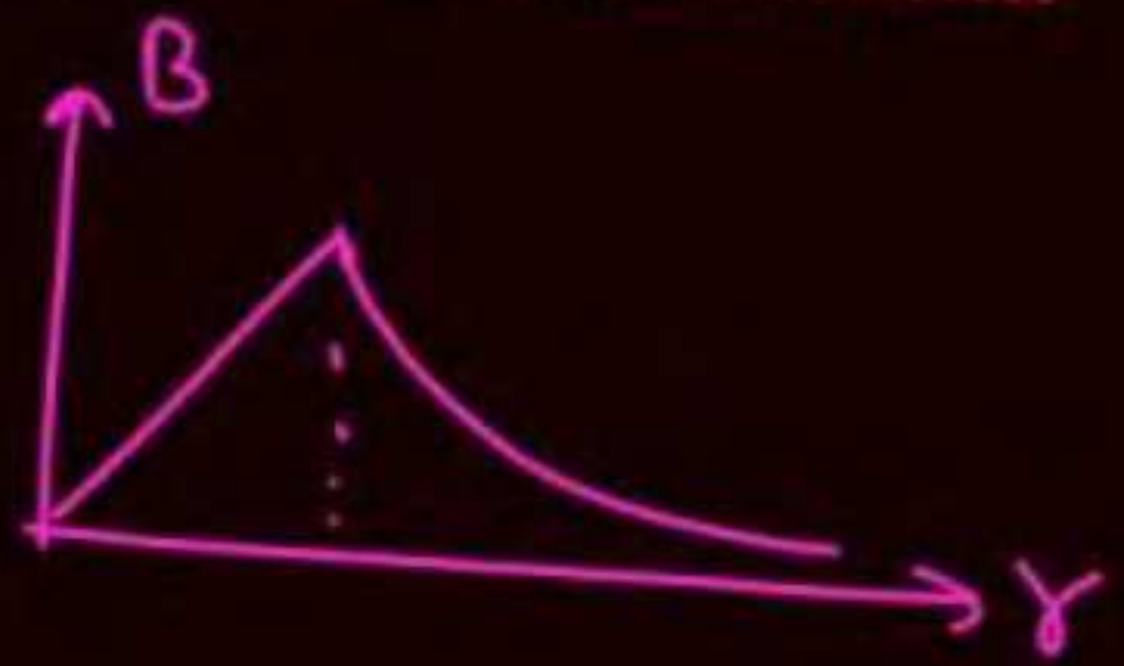
$\equiv$

$$\vec{B} = \mu_0 \left(\frac{\vec{J} \times \overrightarrow{O_1O_2}}{2} \right)$$

$$\vec{B}_{\text{inside cavity}} = \vec{B}_{\text{at } P} = \vec{B}_{\text{due to } 1} + \vec{B}_{\text{due to } 2}$$

$$= \mu_0 \left(\frac{\vec{J} \times \overrightarrow{O_1P}}{2} \right) - \mu_0 \frac{\vec{J} \times \overrightarrow{O_2P}}{2} = \frac{\mu_0 \vec{J} \times \left(\overrightarrow{O_1P} - \overrightarrow{O_2P} \right)}{2} = \frac{\mu_0 \vec{J} \times \overrightarrow{O_1O_2}}{2}$$

Summry

	outside	inside	
① hollow cylinder long.	$B = \frac{2ki}{r}$	0	
② solid cylinder (long)	$B = \frac{2ki}{r}$	$\frac{2kir}{R^2}$ $\frac{\mu_0 \vec{J} \times \vec{r}}{2}$	

Ideal Solenoid.

$r << l$

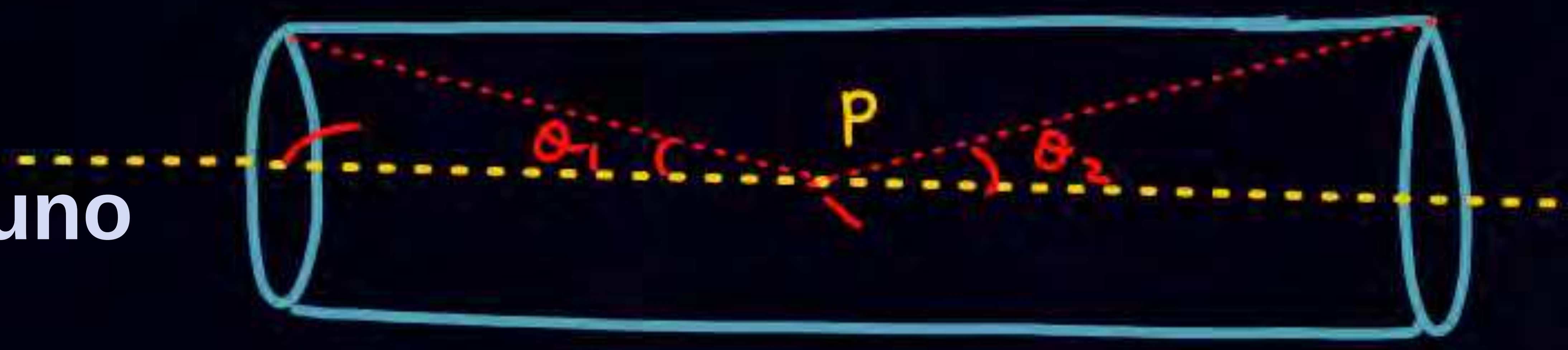
$B_{inside} = \mu_0 n i$ → no. of turn per Unit Length.

proof: next slide

Assumption

- $B_{outside}$ the solenoid is so weak so that we neglect.
- B_{inside} ≡ Axial, Uniform.

#



$$B_{at\ p} = \frac{\mu_0 n i}{2}(\cos\theta_1 + \cos\theta_2)$$

Solenoid (ideal)

① $B_{inside} = \mu_0 n i$

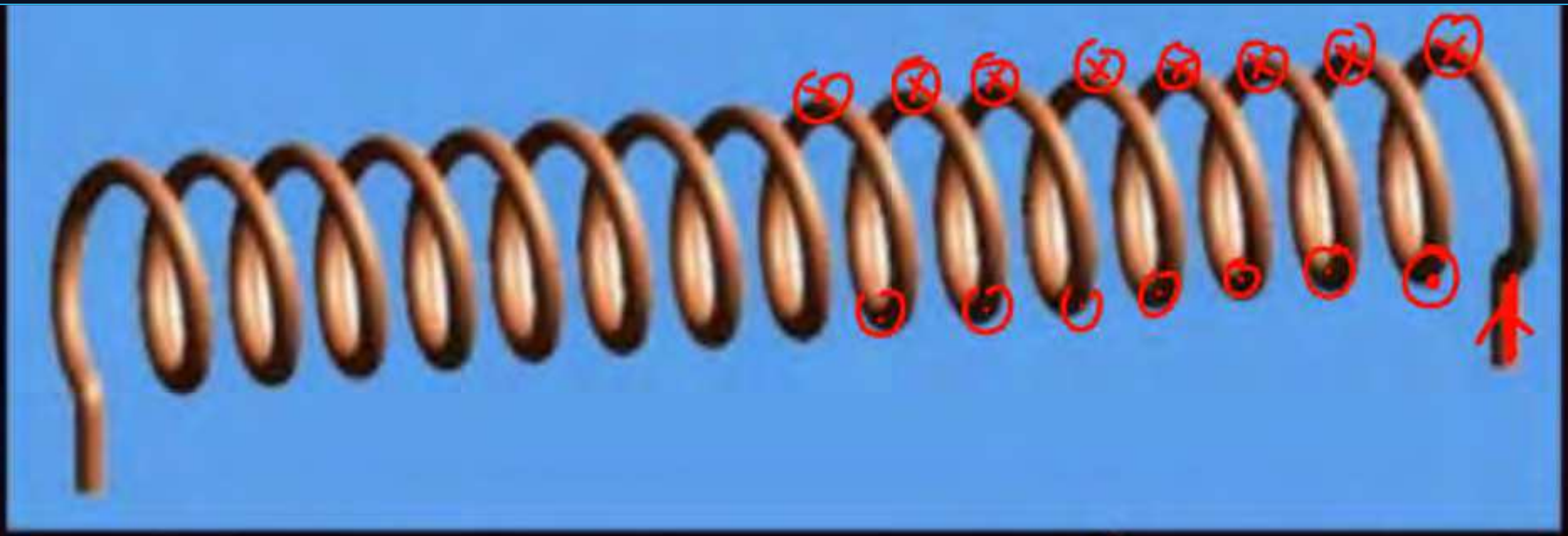
② ideal solenoid (∞ length)

But point is very near to one end of solenoid.

$$B = \frac{\mu_0 n i}{2}$$

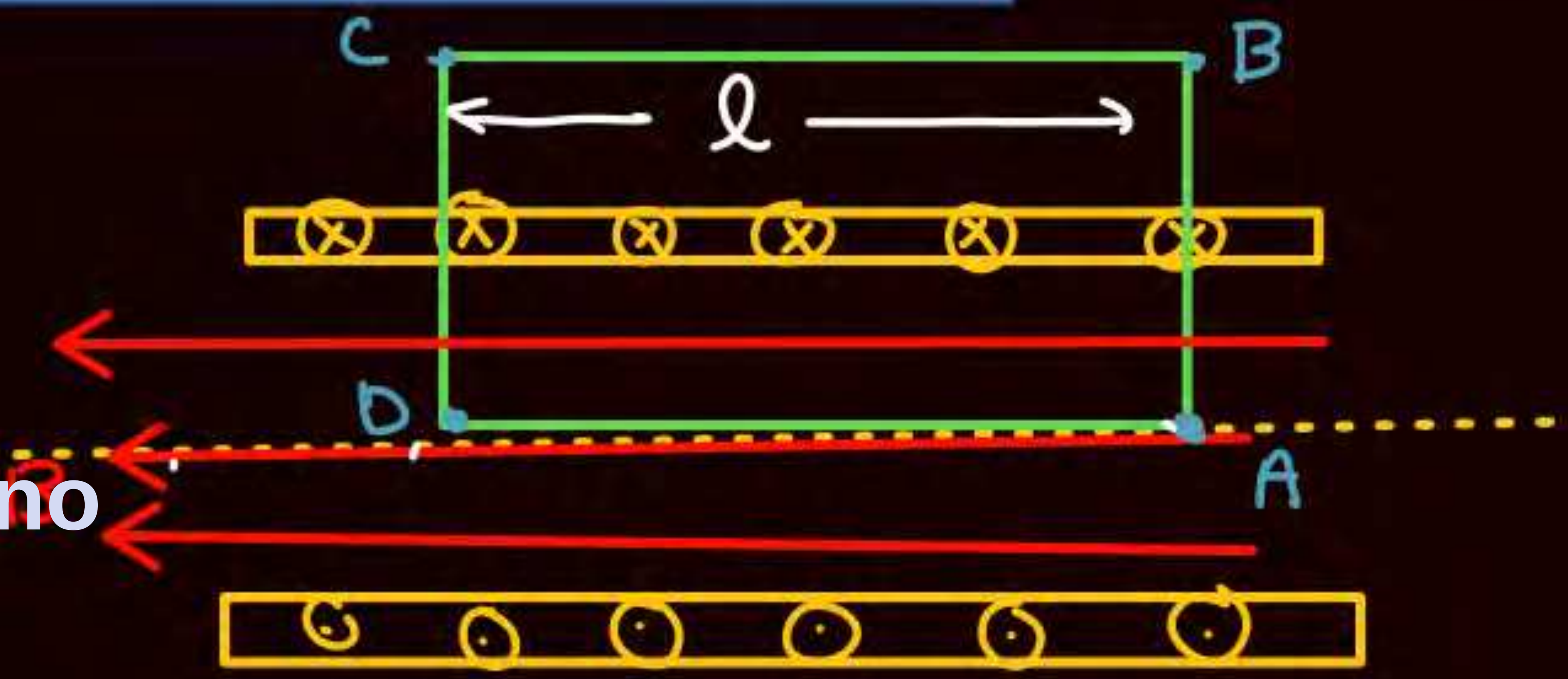
pnt $\theta_1 = 90$

$\theta_2 = 0$



n → no. of turn per Unit length.

$$\oint \vec{B}\cdot d\vec{l} = \mu_0 i_{\text{अंदर}}$$



$$\int_A^D \bar{B}\cdot d\bar{l} + \int_D^C \bar{B}\cdot d\bar{l} + \int_C^B \bar{B}\cdot d\bar{l} + \int_B^A \bar{B}\cdot d\bar{l} = \mu_0 i$$

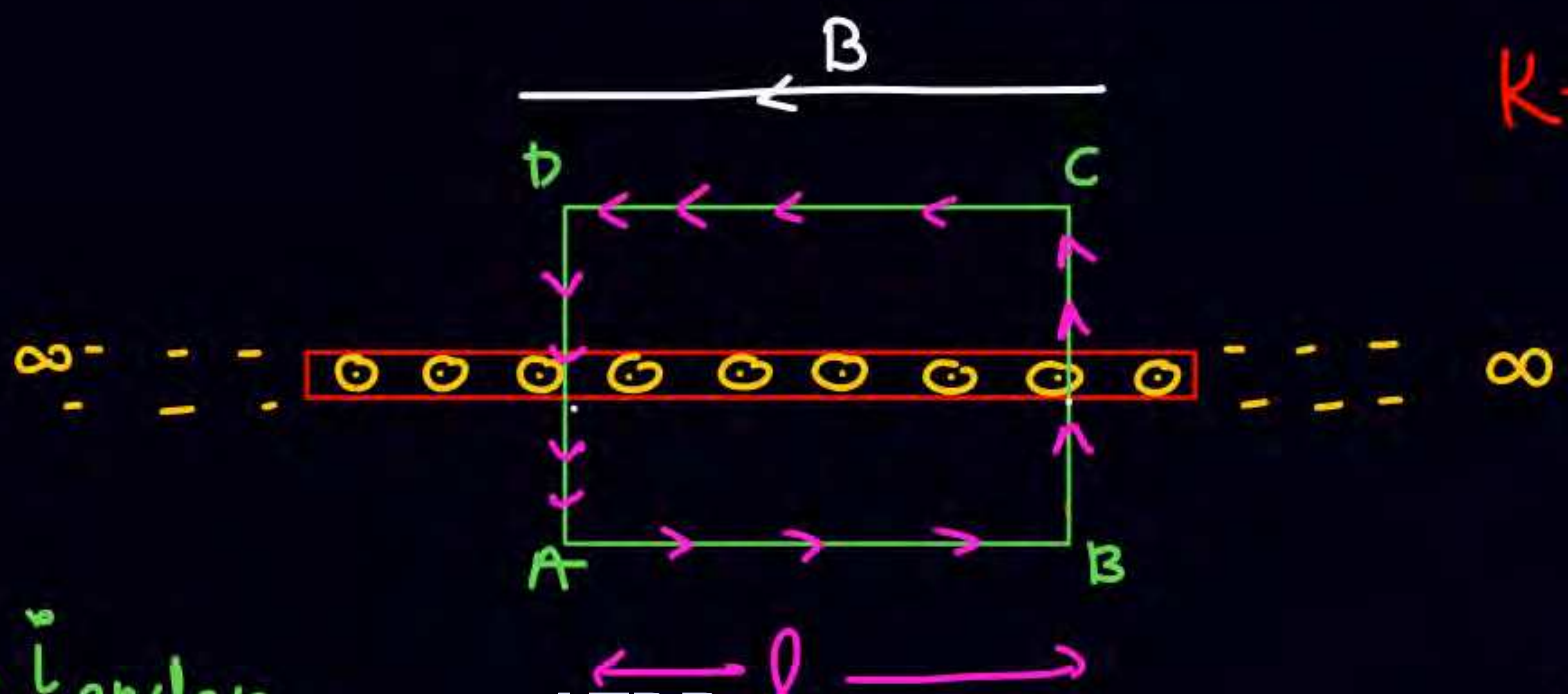
$$B.l + 0 + 0 + 0 = \mu_0 (n l i)$$

$$B l = \mu_0 n l i$$

$$B = \mu_0 n i$$

$$\oint B\,dl = \mu_0 (i + i + i)$$

∞ Sheet



K → Current per Unit length

$$\oint \vec{B}\cdot d\vec{l} = \mu_0 i_{enclose}$$

$$\int_A^B \vec{B}\cdot d\vec{l} + \int_B^C \vec{B}\cdot d\vec{l} + \int_C^D \vec{B}\cdot d\vec{l} + \int_D^A \vec{B}\cdot d\vec{l} = \mu_0 i_{\text{अंदर}}$$

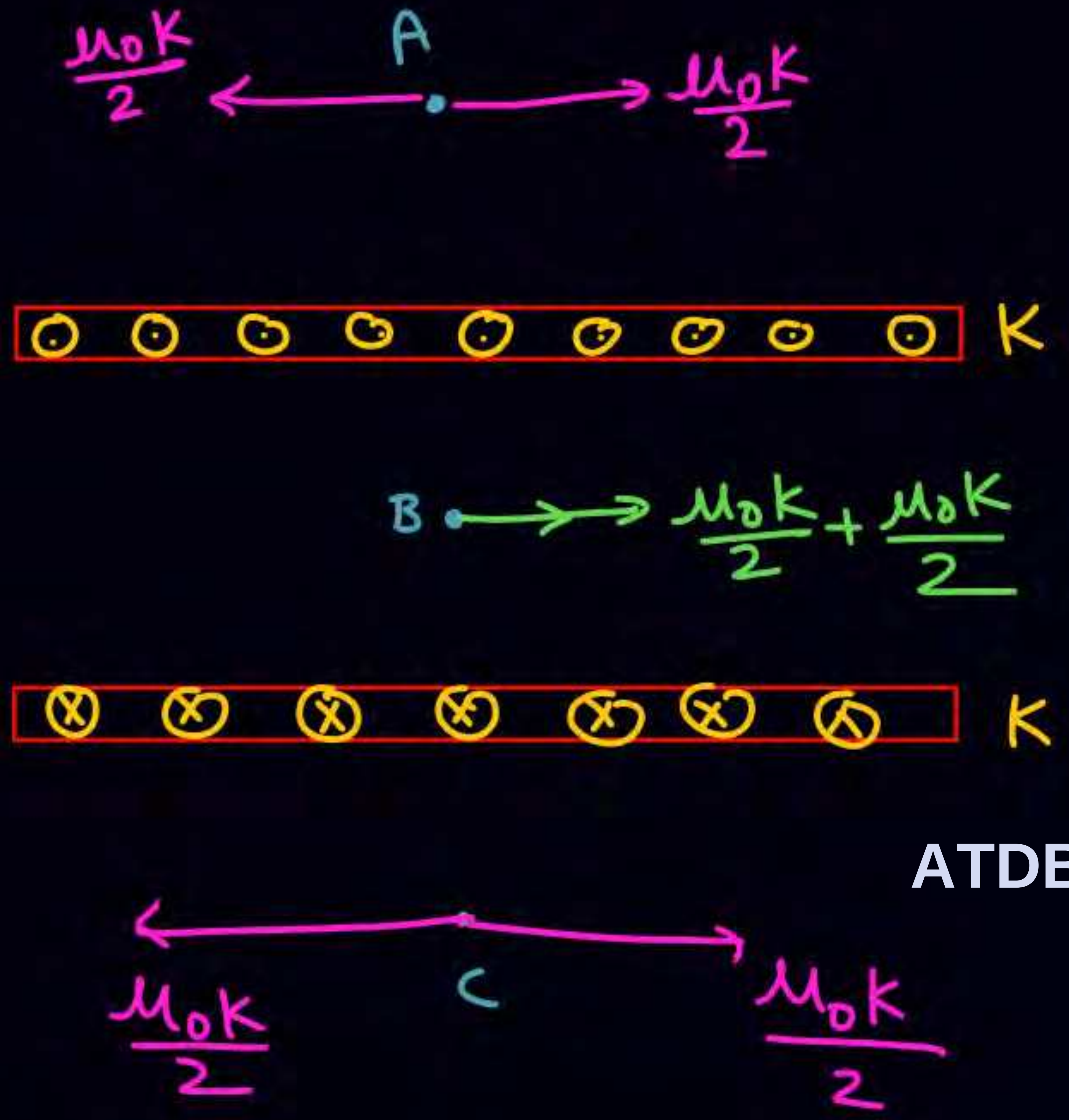
$$B\cdot l + 0 + B\cdot l + 0 = \mu_0 K l$$

$$Bl + Bl = \mu_0 K l$$

$$B = \mu_0 K/2$$

Results

Q



$$B_A = 0$$

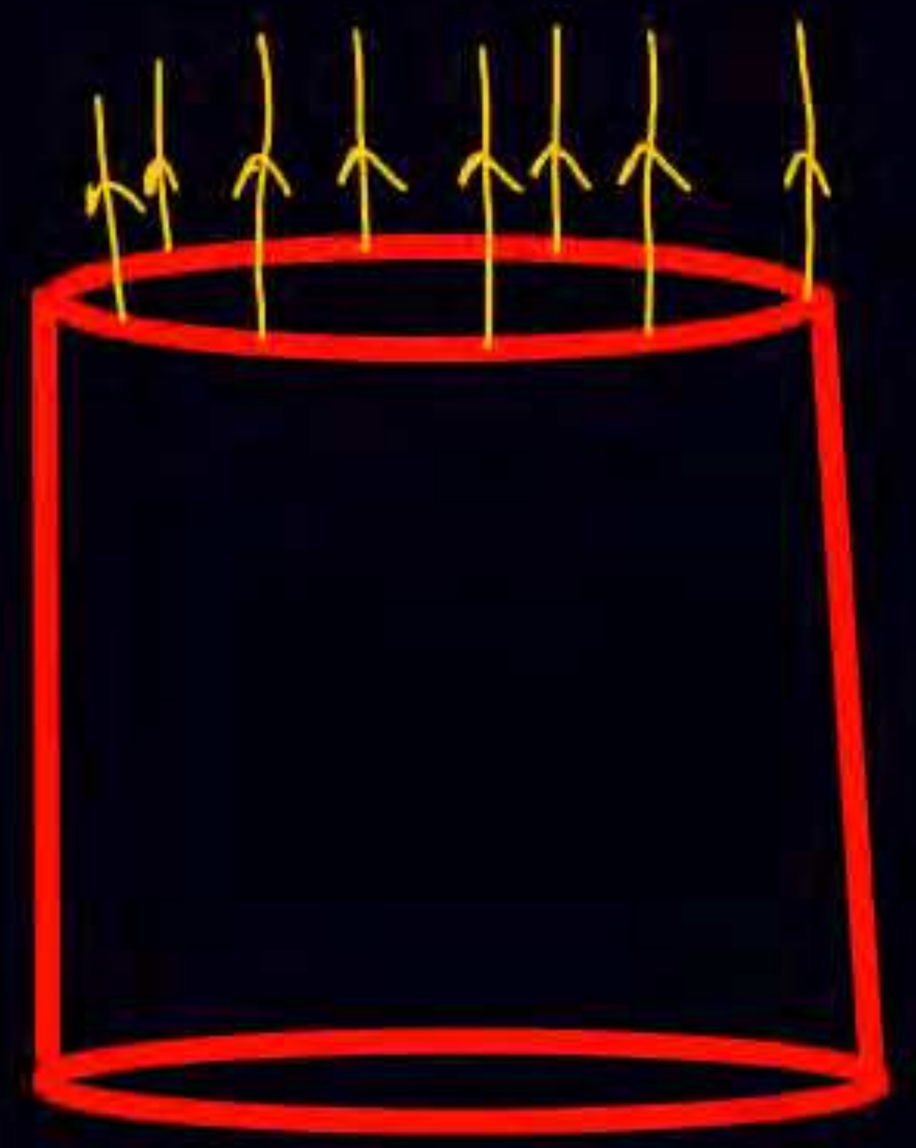
$$B_C = 0$$

$$B_{at\ B} = \mu_0 K$$

① hollow cylinder (long)

$B_{inside} = 0$

$B_{outside} = \frac{2ki}{r}$



② solid cylinder

$B_{outside} = \frac{2ki}{r}$

$B_{inside} = \frac{\mu_0 J r}{2} = \frac{2kir}{R^2}$

$\vec{B} = \frac{\mu_0 \vec{J} \times \vec{r}}{2}$

$\vec{J} \longrightarrow$ current density

③ ideal solenoid

$r <<< l$

$B_{inside} = \mu_0 n i$

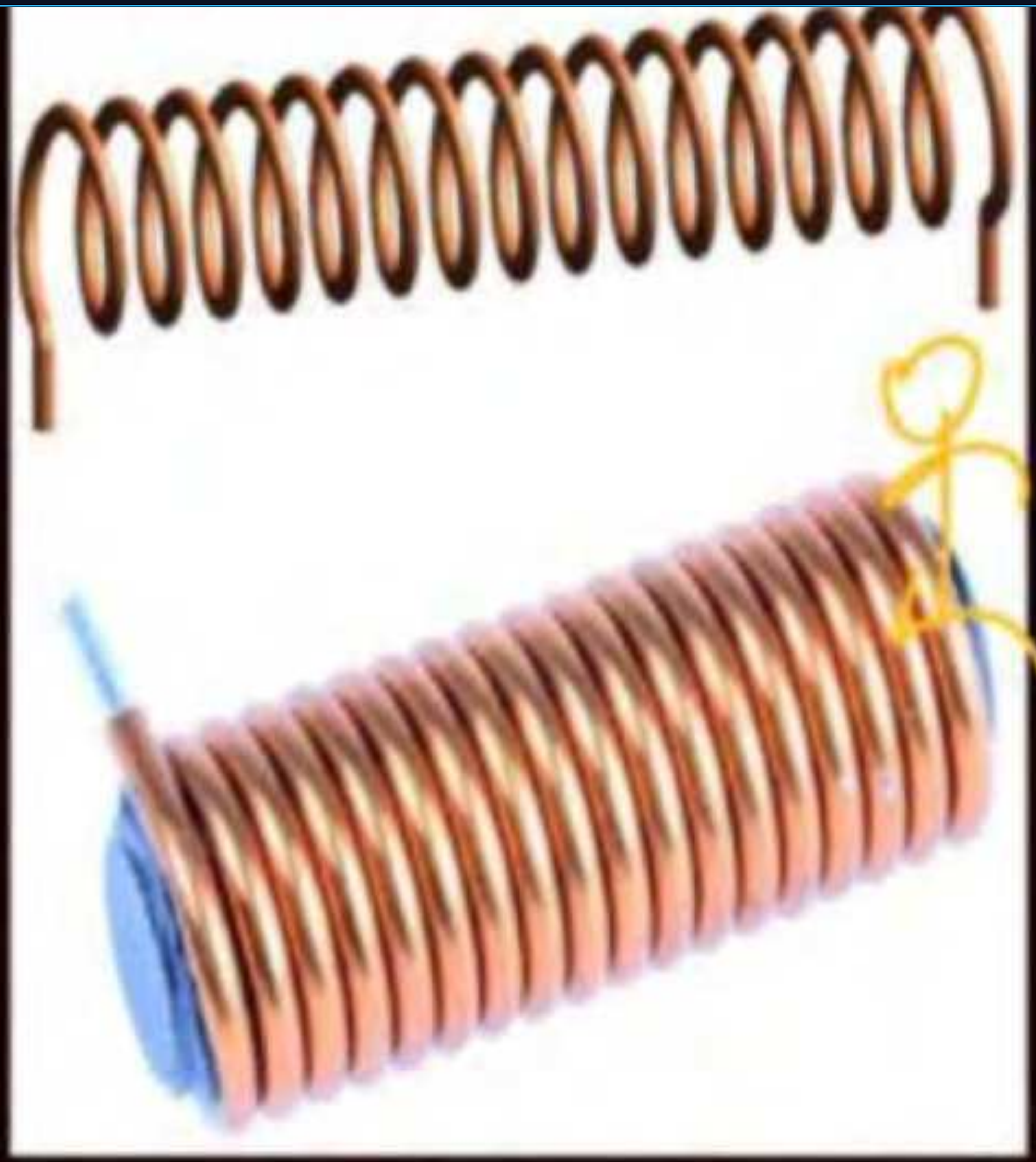
$n \longrightarrow$ no. of turns per unit length

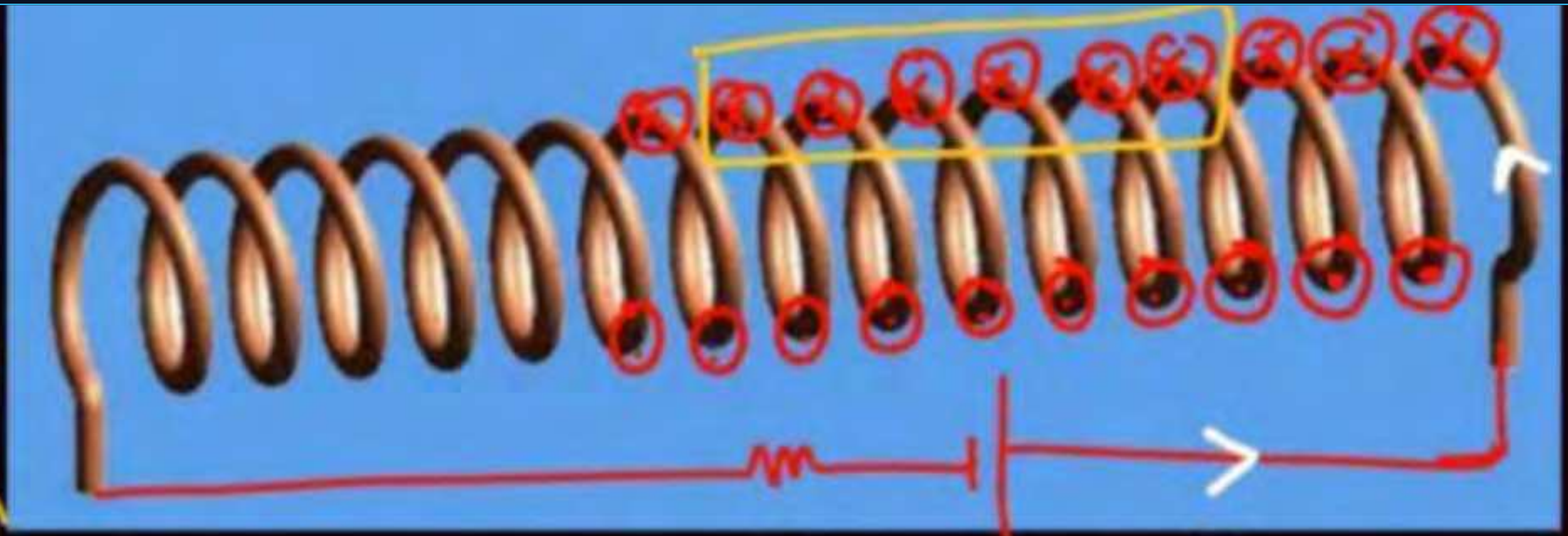
④ Toroid $B_{inside} = \mu_0 \cdot \frac{N}{2\pi r} \cdot i$

$N \longrightarrow$ no. of turn

⑤ ∞ sheet $B = \frac{\mu_0 K}{2}$

$K \longrightarrow$ current per unit length.





$n \rightarrow$ no. of turn per unit length

$Bl = \mu_0 n . l\, i$

$$\boxed{B = \mu_0 n i}$$

$n \rightarrow$ no. of turn per unit length

$$\oint \vec{B}\cdot d\vec{l} = \mu_0 i_{\text{अंदर}}$$

(PQRS)

$$\int_P^Q \vec{B}\cdot d\vec{l} + \int_Q^R \vec{B}\cdot d\vec{l} + \int_R^S \vec{B}\cdot d\vec{l} + \int_S^P \vec{B}\cdot d\vec{l} = \mu_0 i$$

$$Bl + 0 + 0 + 0 = \mu_0 i_{\text{अंदर}}$$

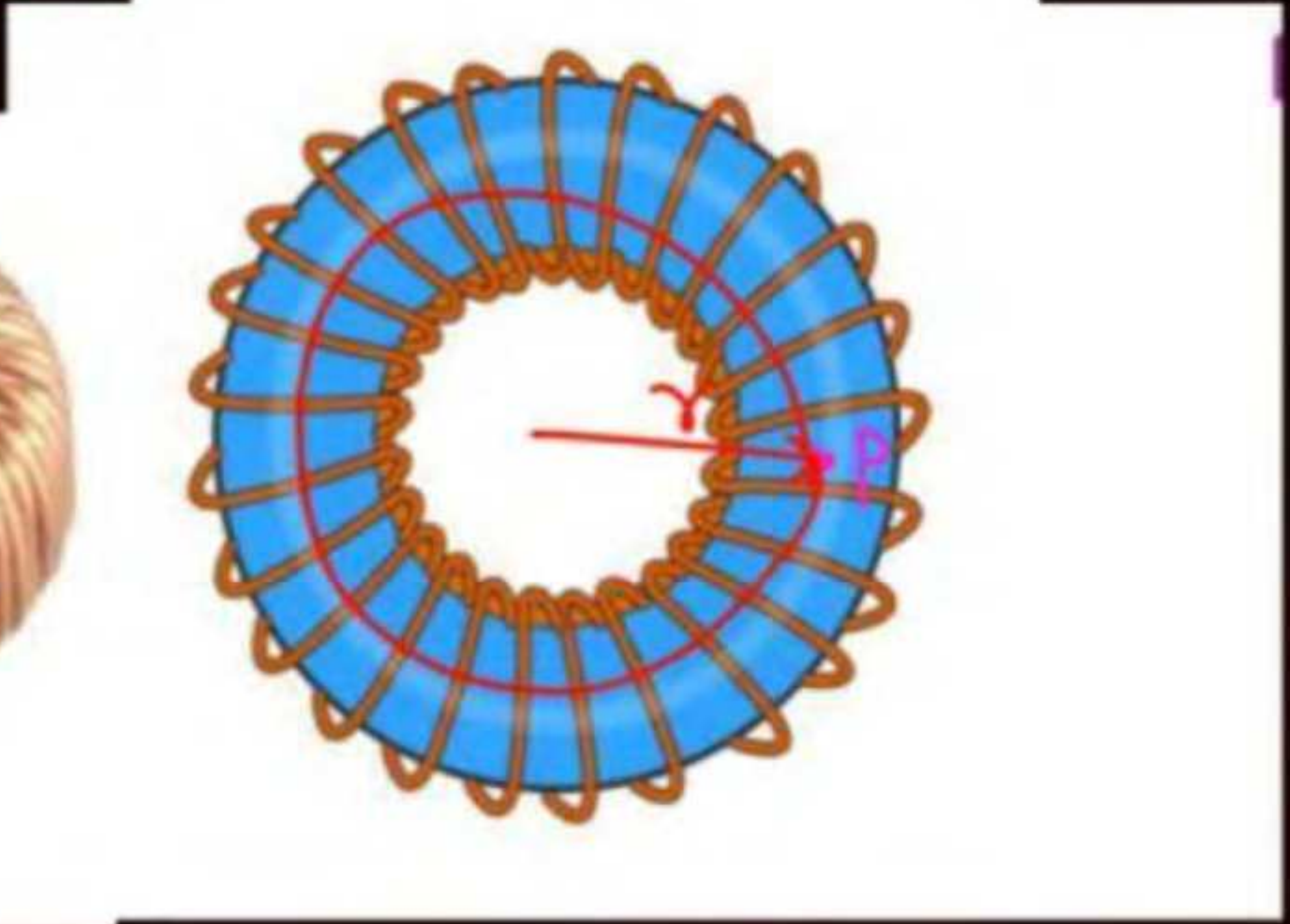
Toroid

- If solenoid bend into circular shape & ends are joined

- $B_{\substack{inside \\ toroid}} = \mu_0 \left(\frac{N}{2\pi r}\right) i = \mu_0 n i$

$n = \frac{N}{2\pi r}$

(N → no. of turns)



QUESTION

A long, straight wire of radius a carries a current distributed uniformly over its cross-section. The ratio of the magnetic fields due to the wire at distance a/3 and $2a$, respectively from the axis of the wire is: [JEE Main-2020]

(1) 2/3

(2) 3/2

(3) 1/2

(4) 2

Ans : (1)

QUESTION -

Magnitude of magnetic field (in SI units) at the centre of a hexagonal shape coil of side 10 cm, 50 turns and carrying current I (Ampere) in units of $\frac{\mu_0 I}{\pi}$ is: [JEE Main-2020]

(1) $250\sqrt{3}$

(2) $5\sqrt{3}$

(3) $500\sqrt{3}$

(4) $50\sqrt{3}$

Ans : (3)

QUESTION - [redacted]

Magnetic fields at two points on the axis of a circular coil at a distance of 0.05 m and 0.2 m from the centre are in the ratio 8 : 1. The radius of coil is ________ .

[JEE Main-2021]

(1) 0.2 m

(2) 0.1 m

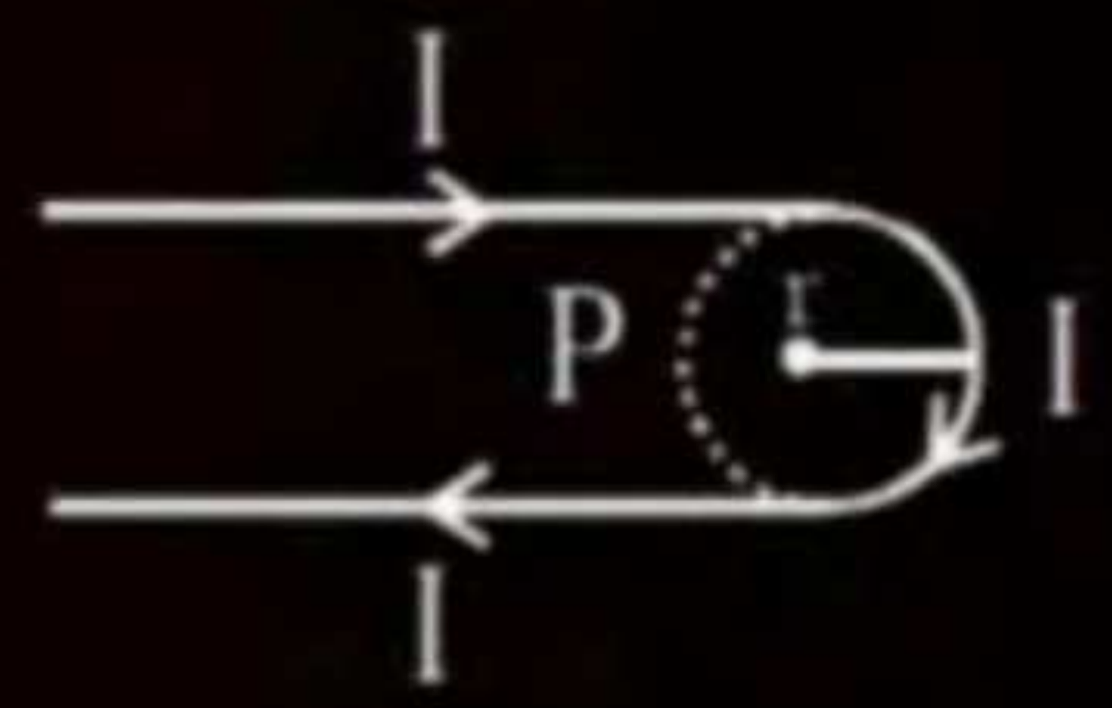
(3) 0.15 m

(4) 1.0 m

Ans : (2)

QUESTION - 3[redacted]

A hairpin like shape as shown in figure is made by bending a long current carrying wire. What is the magnitude of a magnetic field at point P which lies on the centre of the semicircle? **[JEE Main-2021]**



(1) $\frac{\mu_0 I}{4\pi r}(2-\pi)$

(2) $\frac{\mu_0 I}{4\pi r}(2+\pi)$

(3) $\frac{\mu_0 I}{2\pi r}(2+\pi)$

(4) $\frac{\mu_0 I}{2\pi r}(2-\pi)$

Ans : (2)

QUESTION -[redacted]5

A coaxial cable consists of an inner wire of radius 'a' surrounded by an outer shell of inner and outer radii 'b' and 'c' respectively. The inner wire carries an electric current i_0, which is distributed uniformly across cross-sectional area. The outer shell carries an equal current in opposite direction and distributed uniformly. What will be the ratio of the magnetic field at a distance x from the axis when (i) $x < a$ and (ii) $a < x < b$?

[JEE Main-2021]

(1) $\frac{x^2}{a^2}$

(2) $\frac{a^2}{x^2}$

(3) $\frac{x^2}{b^2-a^2}$

(4) $\frac{b^2-a^2}{x^2}$

Ans : (1)

QUESTION -

A current of 1.5 A is flowing through a triangle, of side 9 cm each. The magnetic field at the centroid of the triangle is: (Assume that the current is flowing in the clockwise direction.) [JEE Main-2021]

(1) 3×10^{-7} T, outside the plane of triangle

(2) 23×10^{-7} T, outside the plane of triangle

(3) 23×10^{-5} T, inside the plane of triangle

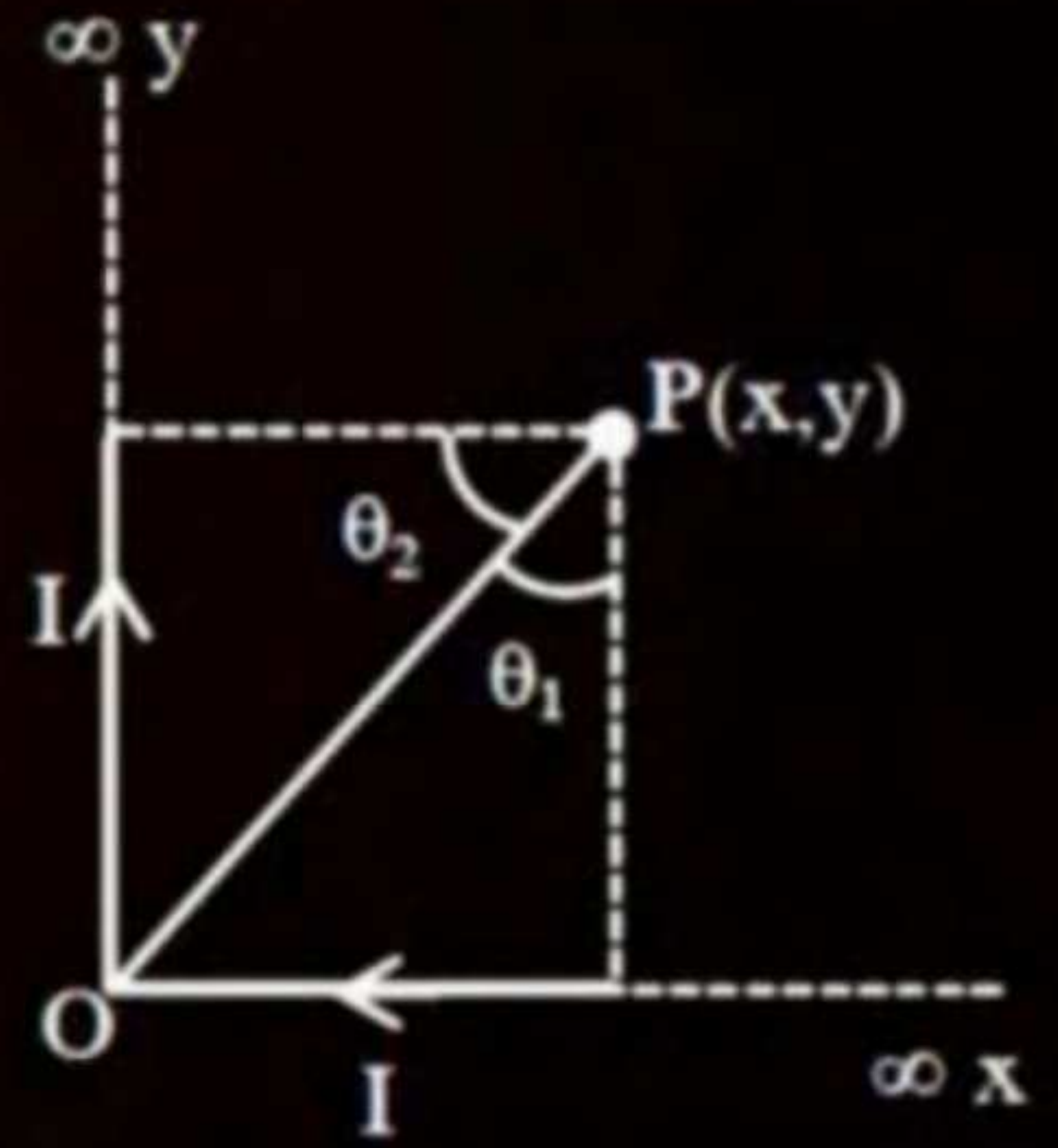
(4) 3×10^{-5} T, inside the plane of triangle

Ans : (4)

QUESTION -

There are two infinitely long straight current carrying conductors and they are held at right angles to each other so that their common ends meet at the origin as shown in the figure given below. The ratio of current in both conductor is 1 : 1. The magnetic field at point P is ______.

[JEE Main-2021]



(1) $\frac{\mu_0 I}{4\pi xy}\left[\sqrt{x^2+y^2}+(x+y)\right]$

(2) $\frac{\mu_0 I}{4\pi xy}\left[\sqrt{x^2+y^2}-(x+y)\right]$

(3) $\frac{\mu_0 Ixy}{4\pi}\left[\sqrt{x^2+y^2}-(x+y)\right]$

(4) $\frac{\mu_0 Ixy}{4\pi}\left[\sqrt{x^2+y^2}+(x+y)\right]$

Ans : (1)

QUESTION -[redacted]2

The electric current in a circular coil of 2 turns produces a magnetic induction B_1 at its centre. The coil is unwound and is rewound into a circular coil of 5 turns and the same current produces a magnetic induction B_2 at its centre. The ratio of B_2/B_1 is:

[JEE Main-2022]

(1) 5/2

(2) 25/4

(3) 5/4

(4) 25/2

Ans : (2)

QUESTION -

B_X and B_Y are the magnetic field at the centre of two coils of two coils X and Y respectively, each carrying equal current. If coil X has 200 turns and 20 cm radius and coil Y has 400 turns and 20 cm radius, the ratio of B_X and B_Y is: [JEE Main-2022]

(1) 1 : 1

(2) 1 : 2

(3) 2 : 1

(4) 4 : 1

Ans : (2)

QUESTION -

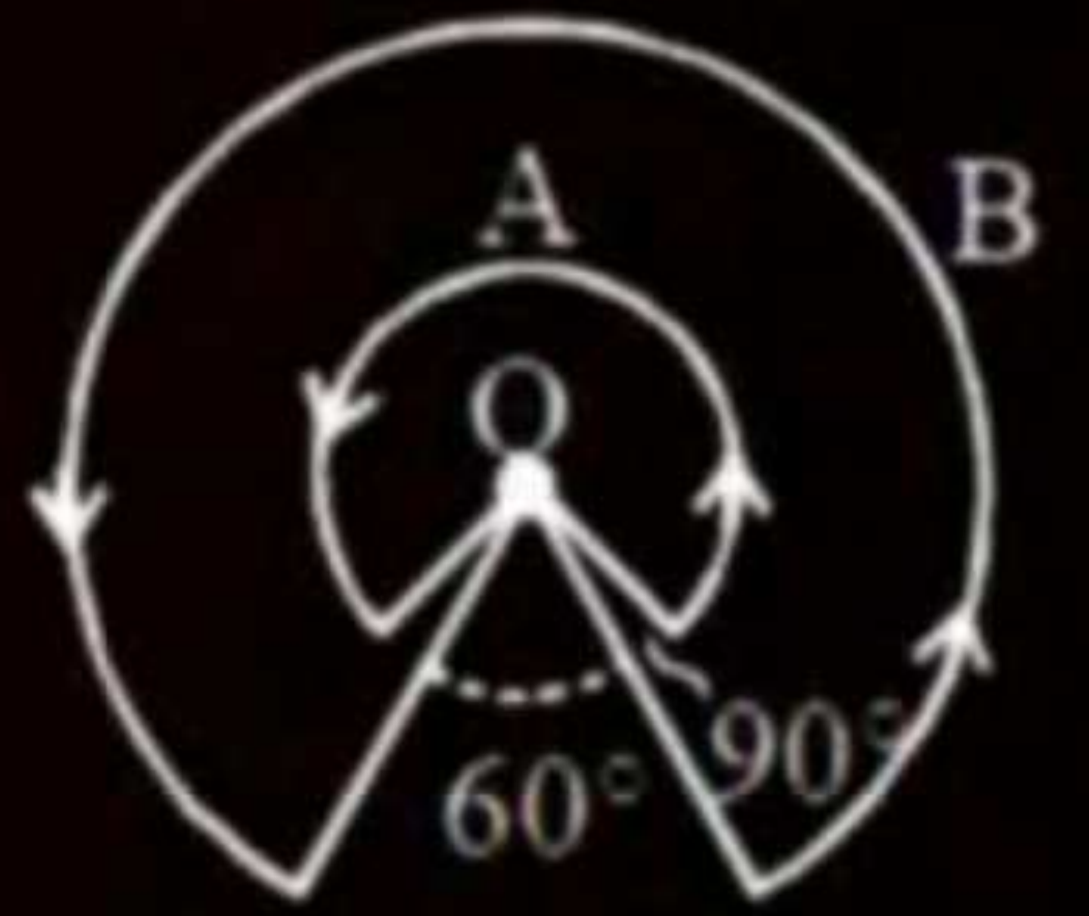
A closely wounded circular coil of radius 5 cm produces a magnetic field of 37.68×10^{-4} T at its center. The current through the coil is ______ A.
[Given, number of turns in the coil is 100 and $\pi = 3.14$] [JEE Main-2022]

Ans : (3)

QUESTION -

A wire A, bent in the shape of an arc of a circle, carrying a current of 2A and having radius 2 cm and another wire B, also bent in the shape of arc of a circle, carrying a current of 3A and having radius of 4 cm, are placed as shown in the figure. The ratio of the magnetic fields due to the wires A and B at the common centre O is:

[JEE Main-2020]



(1) 4 : 6

(2) 6 : 4

(3) 6 : 5

(4) 2 : 5

Ans : (3)

QUESTION - 7

The magnetic field at the center of current carrying circular loop is B_1. The magnetic field at a distance of $\sqrt{3}$ times radius of the given circular loop from the center on its axis is B_2. The value of B_1/B_2 will be: [JEE Main-2022]

(1) $9:4$

(2) $12:\sqrt{5}$

(3) $8:1$

(4) $5:\sqrt{3}$

Ans : (3)

QUESTION - [redacted]

The magnetic field at the centre of a circular coil of radius r, due to current I flowing through it, is B. The magnetic field at a point along the axis at a distance $r/2$ from the centre is:

[JEE Main-2022]

(1) $B/2$

(2) $2B$

(3) $\left(\frac{2}{\sqrt{5}}\right)^3 B$

(4) $\left(\frac{2}{\sqrt{3}}\right)^3 B$

Ans : (3)

QUESTION -

A long straight wire with a circular cross-section having radius R, is carrying a steady current I. The current I is uniformly distributed across this cross-section. Then the variation of magnetic field due to current I with distance r $(r < R)$ from its centre will be:

[JEE Main-2022]

1. $B \propto r^2$

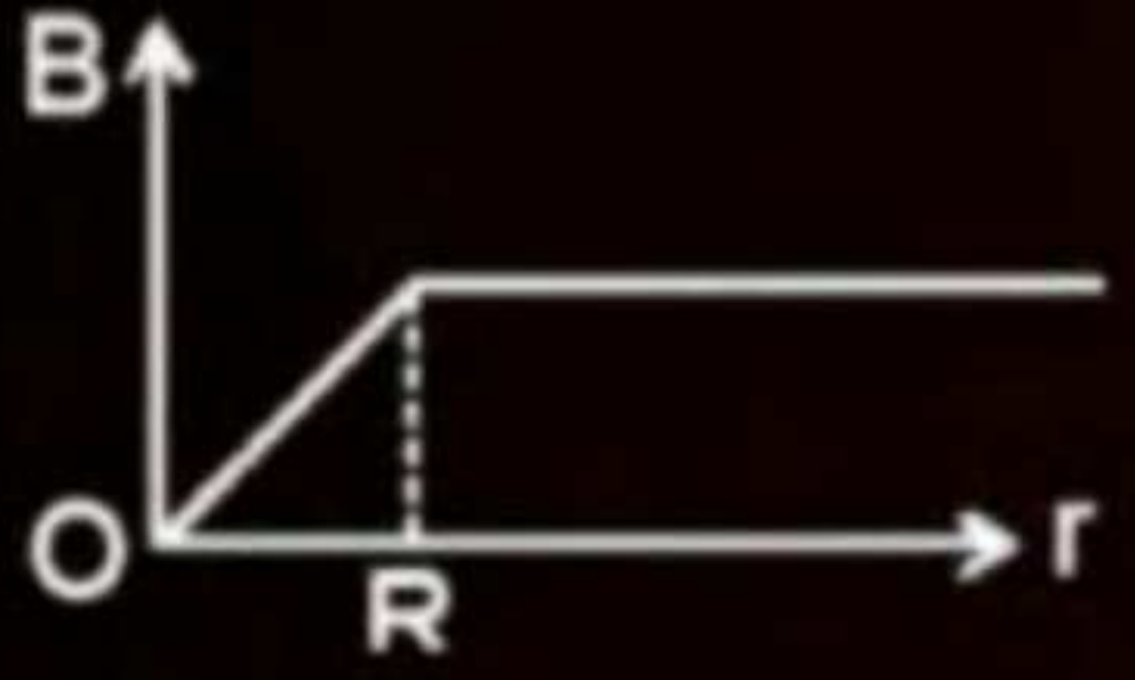
2. $B \propto r$
3. $B \propto 1/r^2$
4. $B \propto 1/r$

Ans : (2)

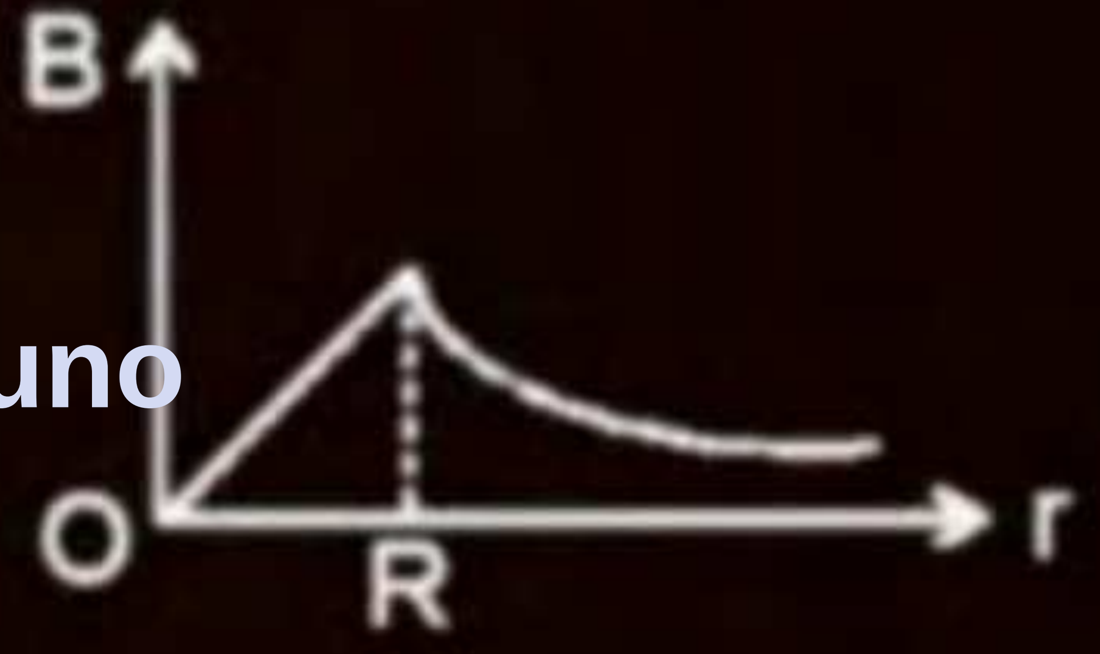
QUESTION -

An infinitely long hollow conducting cylinder with radius R carries a uniform current along its surface. Choose the correct representation of magnetic field (2) as a function of radial distance (r) from the axis of cylinder. [JEE Main-2022]

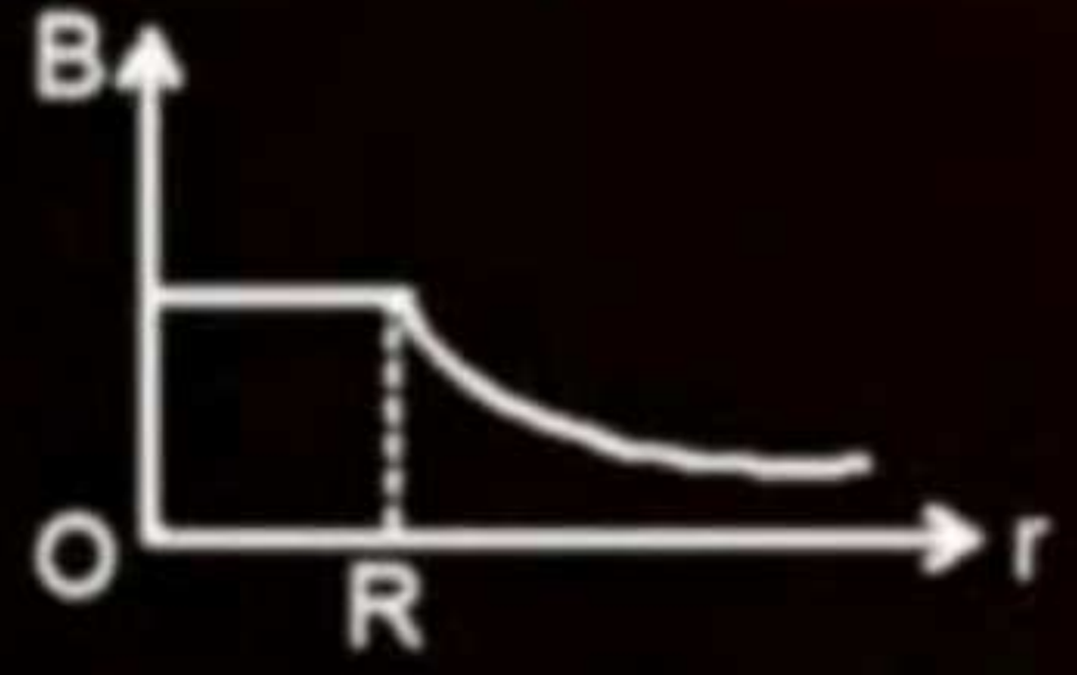
(1)



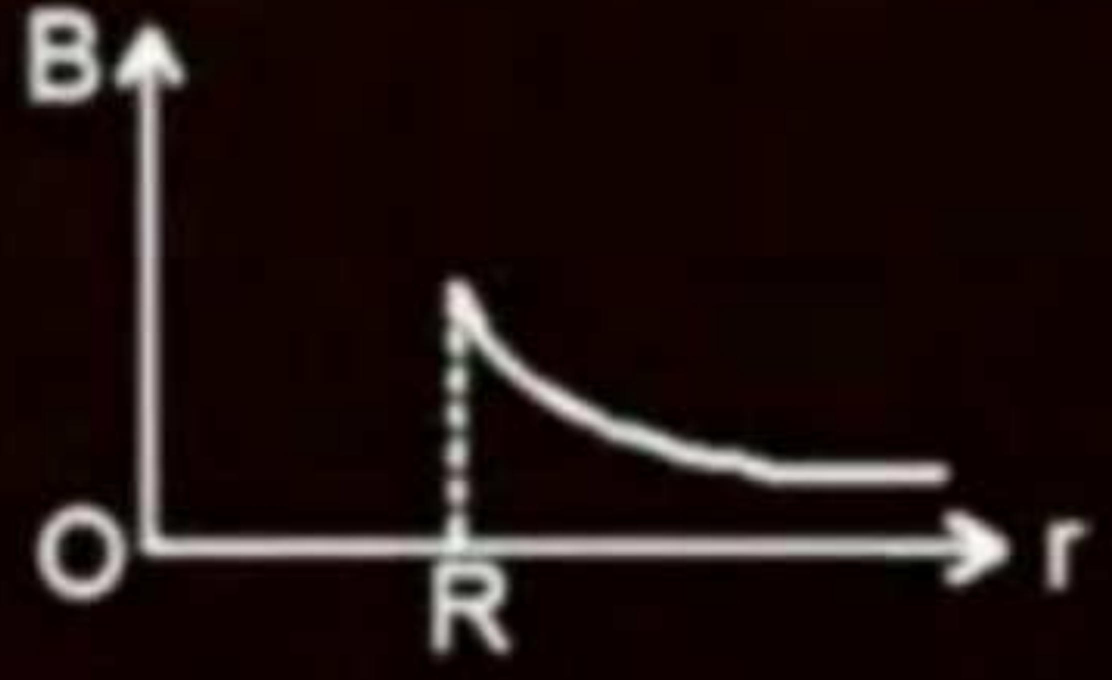
(2)



(3)



(4)



Ans : (4)

QUESTION -

Two long current carrying conductors are placed parallel to each other at a distance of 8 cm between them. The magnitude of magnetic field produced at mid-point between the two conductors due to current flowing in them is 300 μT. The equal current flowing in the two conductors is: [JEE Main-2022]

(1) 30A in the same direction

(2) 30A in the opposite direction

(3) 60A in the opposite direction.

(4) 300A in the opposite direction

Ans : (2)

QUESTION - [redacted]

A circular loop of radius r is carrying current I A. The ratio of magnetic field at the centre of circular loop and at a distance r from the center of the loop on its axis is:

[24 January 2023 - Shift 1]

(1) $1:3\sqrt{2}$

(2) $3\sqrt{2}:2$

(3) $2\sqrt{2}:1$

(4) $1:\sqrt{2}$

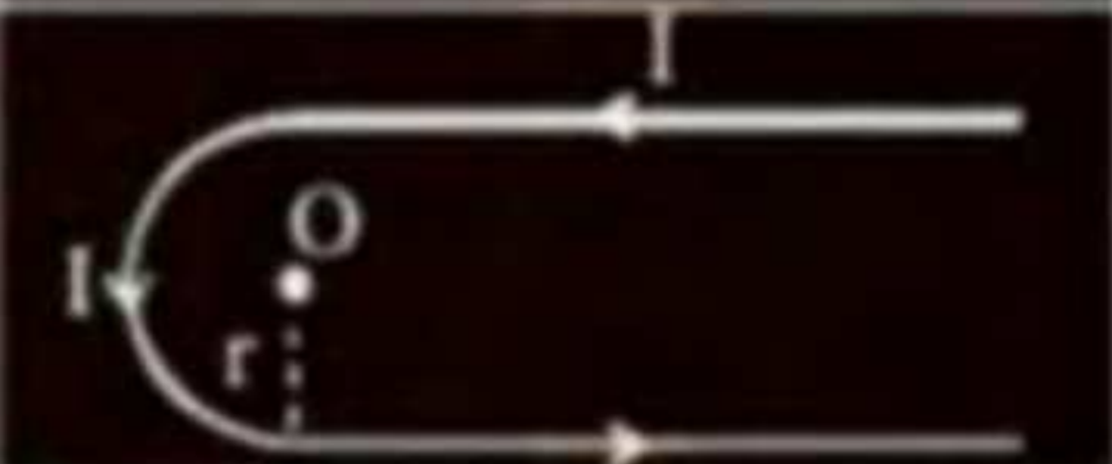
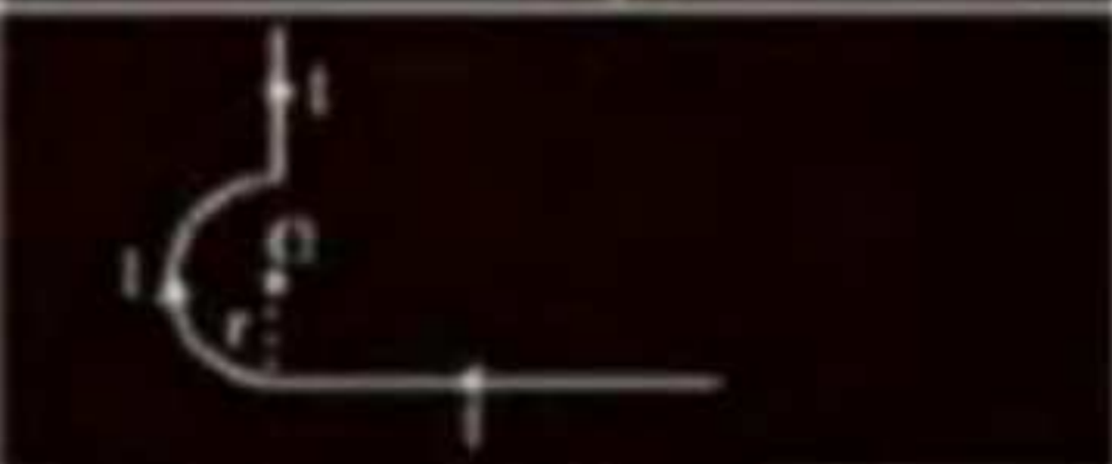
Ans : (3)

QUESTION - [redacted]

Match List I with List II

[25 January 2023 - Shift 1]

Choose the correct answer from the option given below:

	List – I (Current configuration)		List – II (Magnetic field at point O)
A		I.	$B_0 = \frac{\mu_0 I}{4\pi r}[\pi + 2]$
B		II.	$B_0 = \frac{\mu_0}{4}\frac{I}{r}$
C		III.	$B_0 = \frac{\mu_0 I}{2\pi r}[\pi - 1]$
D		IV	$B_0 = \frac{\mu_0 I}{4\pi r}[\pi + 1]$

(1) A–III, B–IV, C–I, D–II

(2) A–I, B–III, C–IV, D–II

(3) A–III, B–I, C–IV, D–II

(4) A–II, B–I, C–IV, D–III

Ans : (3)

QUESTION - [redacted]

Two long parallel wires carrying currents 8A and 15 A in opposite directions are placed at a distance of 7 cm from each other. A point P is at equidistant from both the wires such that the lines joining the point P to the wires are perpendicular to each other. The magnitude of magnetic field at P is $\times 10^{-6}$ T.

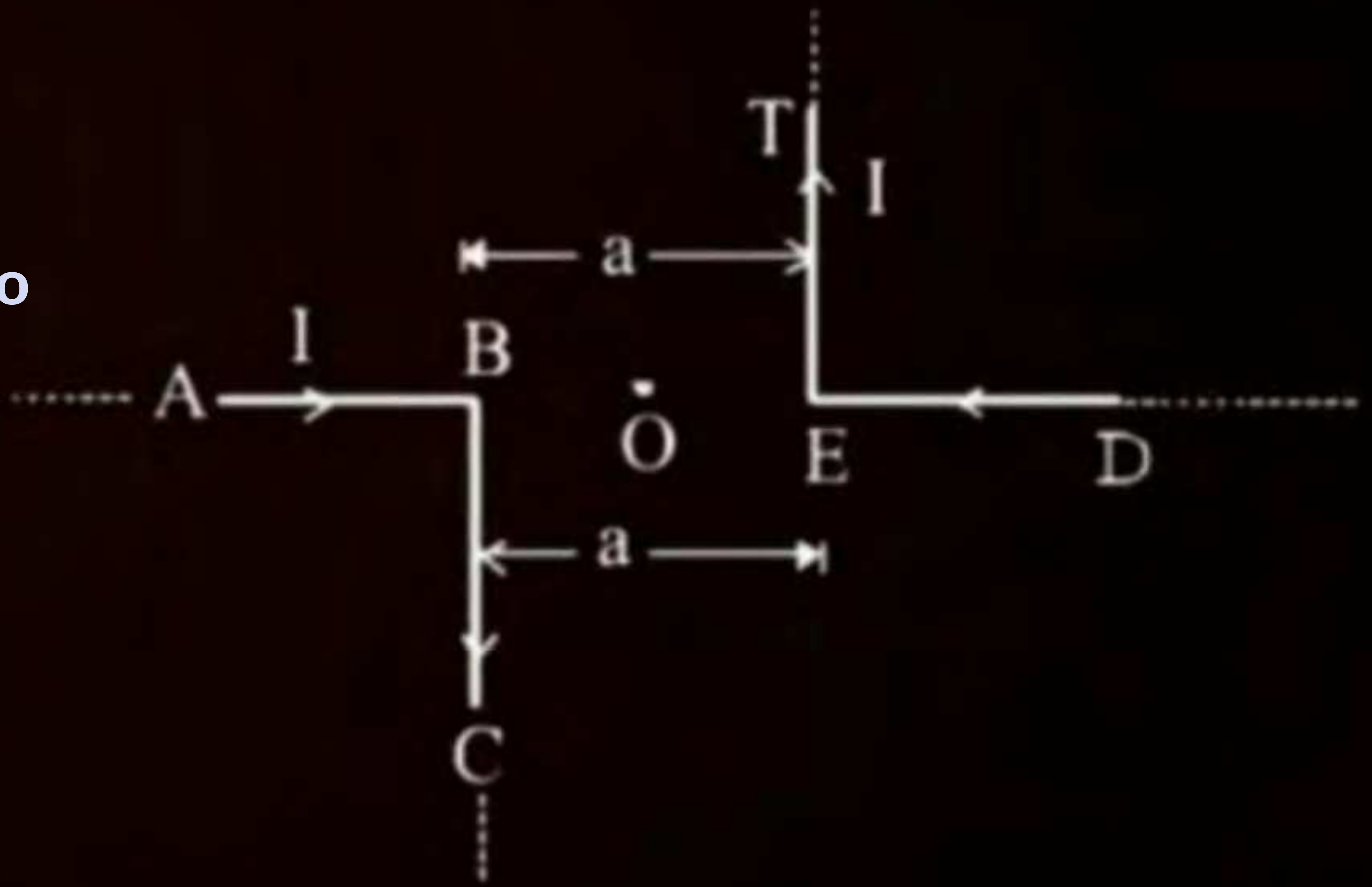
(Given : $\sqrt{2} = 1.4$) **[25 January 2023 - Shift 2]**

Ans : (68)

QUESTION - [redacted]

The magnitude of magnetic induction at mid-point O due to current arrangement as shown in Fig will be:

[29 January 2023 - Shift 1]



(1) $\frac{\mu_0 I}{2\pi a}$

(2) 0

(3) $\frac{\mu_0 I}{4\pi a}$

(4) $\frac{\mu_0 I}{\pi a}$

Ans : (4)

QUESTION - [redacted]

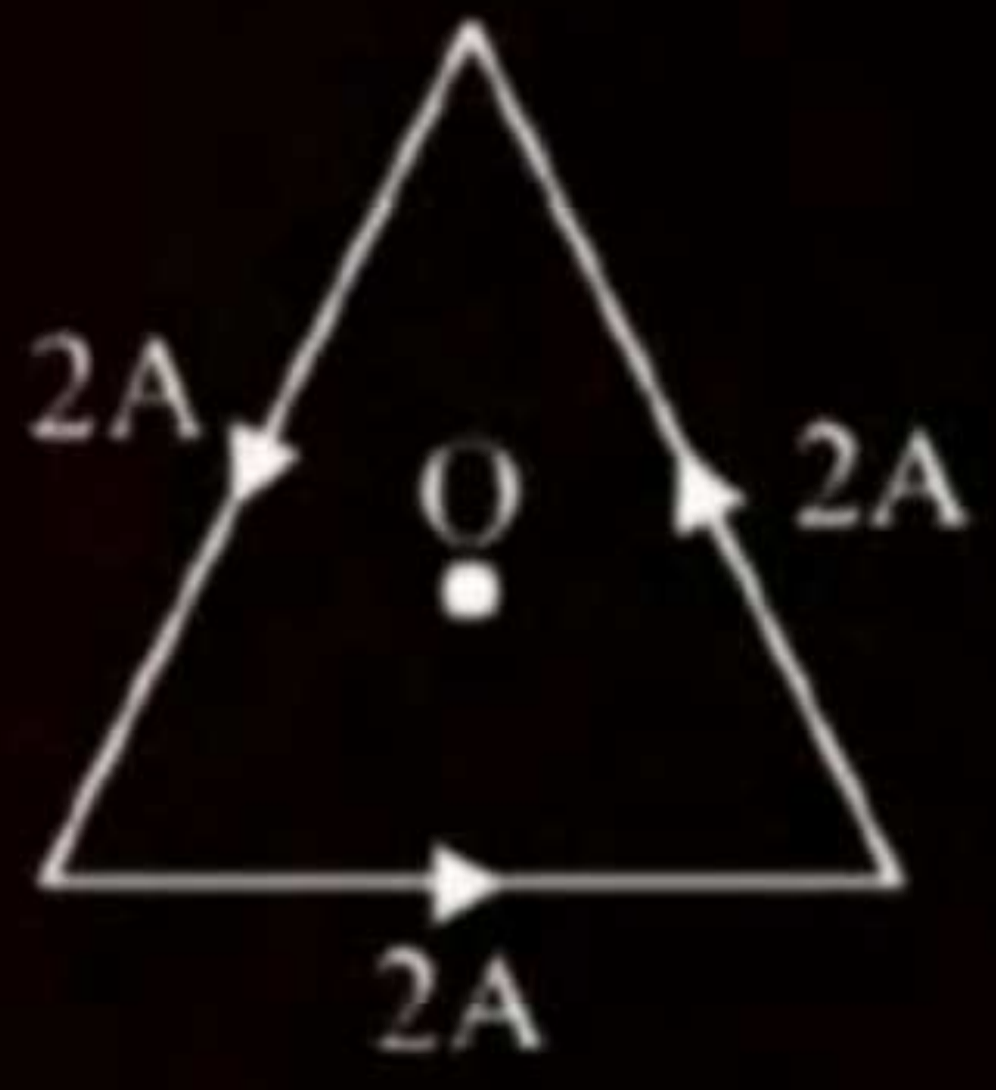
As shown in the figure, a current of 2A flowing in an equilateral triangle of side $4\sqrt{3}$ cm. The magnetic field at the centroid O of the triangle is:
(Neglect the effect of earth's magnetic field.) [30 January 2023 - Shift 2]

(1) $4\sqrt{3} \times 10^{-4}$ T

(2) $4\sqrt{3} \times 10^{-5}$ T

(3) $\sqrt{3} \times 10^{-4}$ T

(4) $3\sqrt{3} \times 10^{-5}$ T



Ans : (4)

QUESTION -

A long conducting wire having a current I flowing through it, is bent into a circular coil of N turns. Then it is bent into a circular coil of n turns. The magnetic field is calculated at the centre of coils in both the cases. The ratio of the magnetic field in first case to that of second case is: [31 January 2023 - Shift 2]

1. $N : n$
2. $n^2 : N^2$
3. $N^2 : n^2$
4. $n : N$

Ans : (3)

QUESTION - [redacted]

Find the magnetic field at the point P in figure. The curved portion is a semicircle connected to two long straight wires.

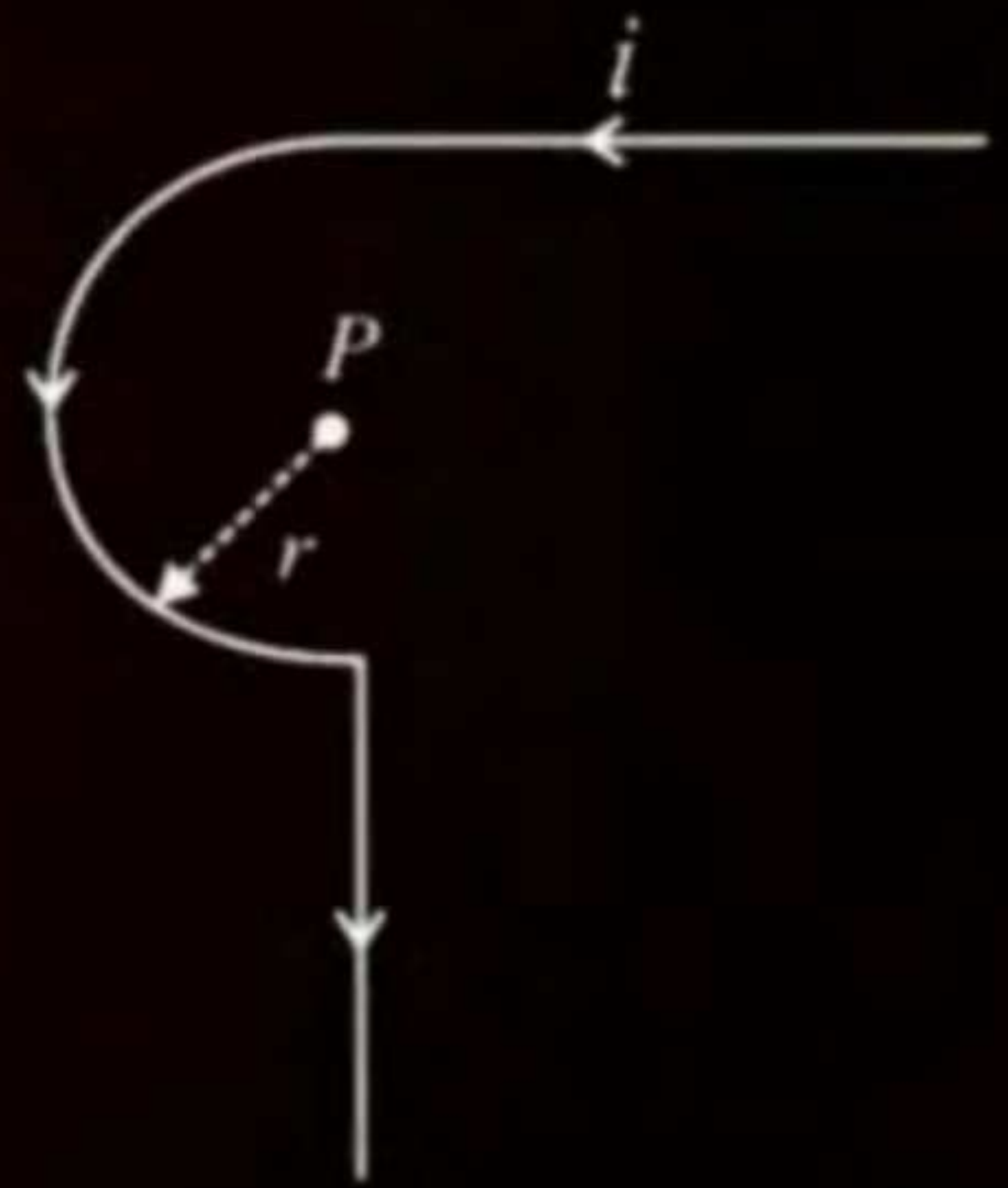
[01 February 2023 - Shift 1]

(1) $\frac{\mu_0 i}{2r}\left(1+\frac{2}{\pi}\right)$

(2) $\frac{\mu_0 i}{2r}\left(1+\frac{1}{\pi}\right)$

(3) $\frac{\mu_0 i}{2r}\left(\frac{1}{2}+\frac{1}{2\pi}\right)$

(4) $\frac{\mu_0 i}{2r}\left(\frac{1}{2}+\frac{1}{\pi}\right)$



Ans : (3)

QUESTION - [redacted]

As shown in the figure, a long straight conductor with semicircular arc of radius $\frac{\pi}{10}$ m is carrying current I = 3 A. The magnitude of the magnetic field. at the center O of the arc is: (The permeability of the vacuum = $4\pi \times 10^{-7}$ NA^{-2}) **[01 February 2023 - Shift 2]**

(1) 6 μT

(2) 1 μT

(3) 4 μT

(4) 3 μT

Ans : (4)

QUESTION - [redacted]

A long straight wire of circular cross-section (radius a) is carrying steady current I. The current I is uniformly distributed across this cross-section. The magnetic field is:

[06 April 2023 - Shift 1]

(1) inversely proportional to r in the region $r < a$ and uniform throughout in the region $r > a$.

(2) directly proportional to r in the region $r < a$ and inversely proportional to r in the region $r > a$.

(3) Zero in the region $r < a$ and inversely proportional to r in the region $r > a$.

(4) uniform in the region $r < a$ and inversely proportional to distance r from the axis, in the region $r > a$.

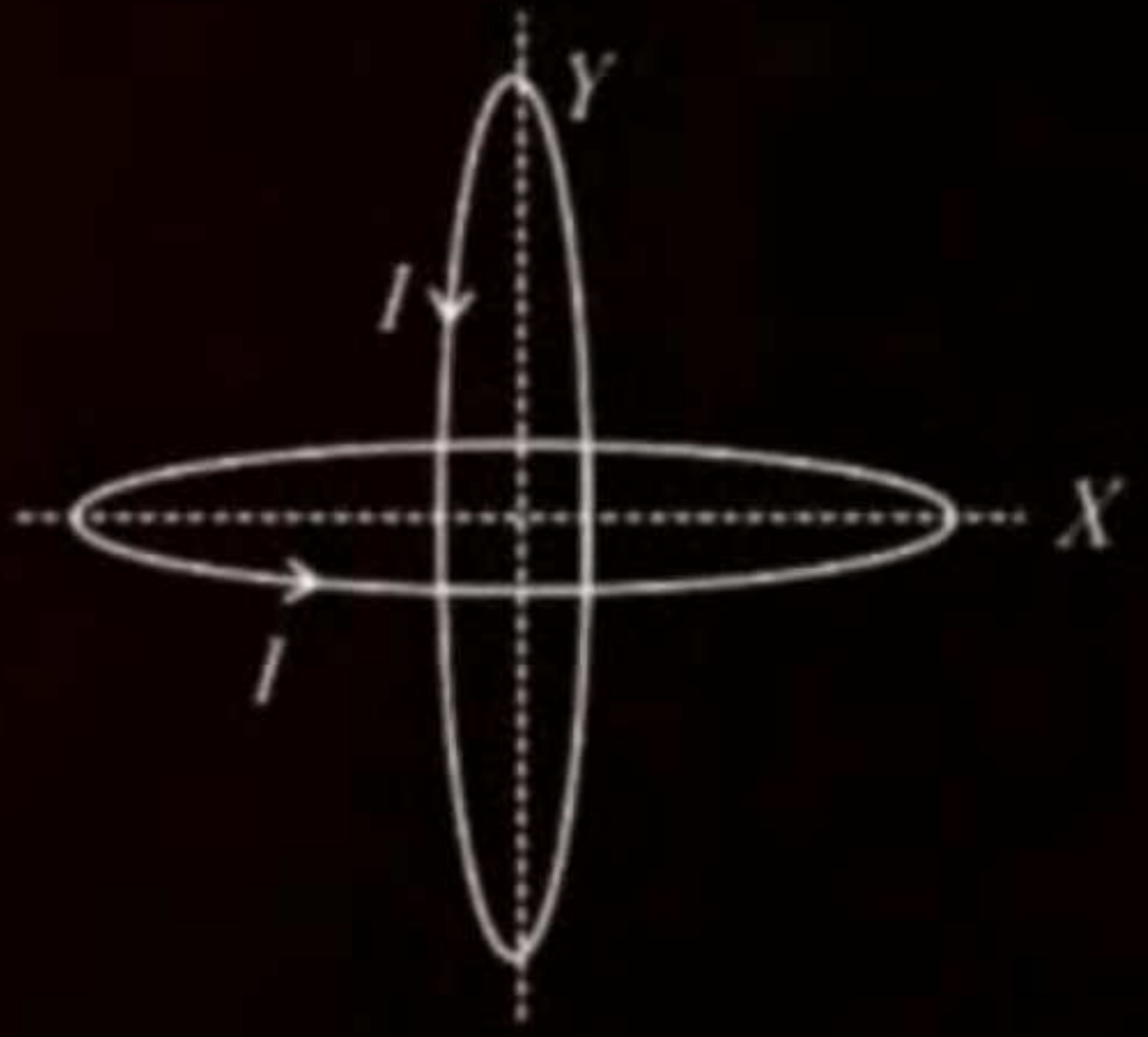
Ans : (2)

QUESTION - [redacted]

Two identical circular wires of radius 20 cm and carrying current $\sqrt{2}$ A are placed in perpendicular planes as shown in figure. The net magnetic field at the centre of the circular wires is ________ $\times 10^{-8}$ T.

(Take $\pi = 3.14$)

[06 April 2023 - Shift 1]



Ans : (628)

The ratio of magnetic field at the centre of a current carrying coil of radius r to the magnetic field at distance r from the centre of coil on its axis is $\sqrt{x} : 1$. The value of x is ________.

[08 April 2023 - Shift 2]

$$B_{center} = \frac{\mu_0 i}{2R}$$

$$B_A = \frac{\mu_0 i R^2}{2(R^2 + x^2)^{3/2}} = \frac{\mu_0 i R^2}{2(R^2 + R^2)^{3/2}}$$

$$B_A = \frac{\mu_0 i R^2}{2R^3 (2\sqrt{2})}$$

Ans $2\sqrt{2} : 1$

$\sqrt{8} : 1$

Ans : (8)

QUESTION - 1

A straight wire carrying a current of 14 A is bent into a semicircular arc of radius 2.2 cm as shown in the figure. The magnetic field produced by the current at the centre O of the arc is ______ $\times 10^{-4}$ T.

[10 April 2023 - Shift 2]

Ans : (2)

QUESTION - [redacted]

A regular polygon of 6 sides is formed by bending a wire of length 4π meter. If an electric current of $4\pi\sqrt{3}$ A is flowing through the sides of the polygon, the magnetic field at the centre of the polygon would be $x \times 10^{-7}$ T. The value of x is ________.

[01 Feb. 2024 - Shift 1]

Ans : (72)

QUESTION - [redacted]

The magnetic field at the centre of a wire loop formed by two semicircular wires of radii $R_1 = 2\pi$ m and $R_2 = 4\pi$ m carrying current I = 4A as per figure given below is $\alpha \times 10^{-7}$ T. The value of α is ______.

(Centre O is common for all segments).

[27 Jan. 2024 - Shift 2]

Ans : (3)

QUESTION - [redacted]

The current of 5A flows in a square loop of sides 1 m is placed in air. The magnetic field at the centre of the loop is $X\sqrt{2} \times 10^{-7}$ T. The value of X is ________.

[30 Jan. 2024 - Shift 2]

Ans : (40)

QUESTION

Two circular coils P and Q of 100 turns each have same radius of π cm. The currents in and are 1 A and 2 A respectively. P and Q are placed with their planes mutually perpendicular with their centers coincide. The resultant magnetic field induction at the center of the coils is $\sqrt{x}$ mT, where x = ______ .

(Use $\mu_0 = 4\pi \times 10^{-7}$ Tm A^{-1})

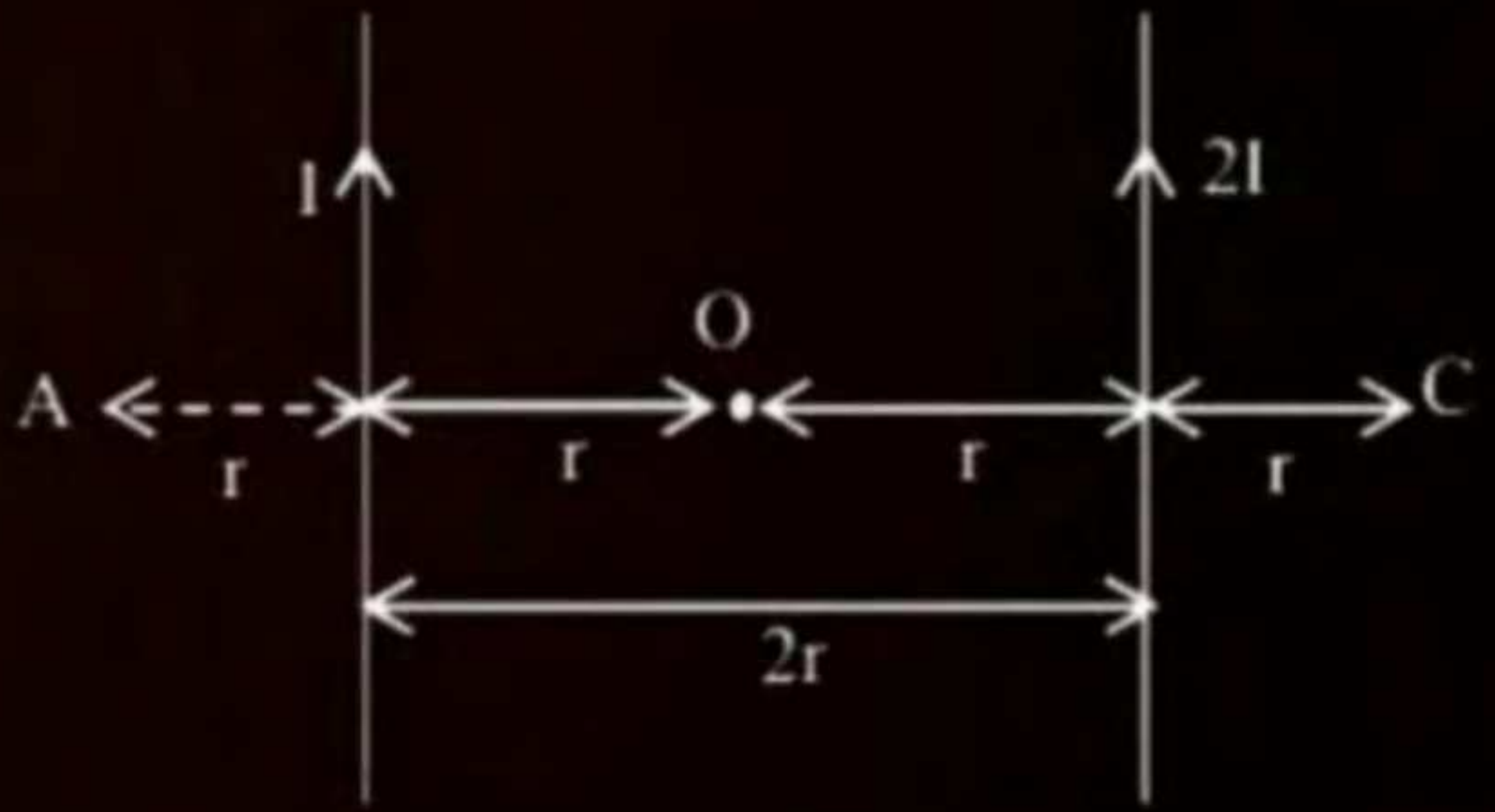
[31 Jan. 2024 - Shift 2]

Ans : (20)

QUESTION - [redacted]

Two parallel long current carrying wire separated by a distance 2r are shown in the figure. The ratio of magnetic field at A to the magnetic field produced at C is x/7. The value of x is _____.

[04 Apr. 2024 - Shift 2]



Ans : (5)

QUESTION - [redacted]

A long straight wire of radius a carries a steady current I. The current is uniformly distributed across its cross section. The ratio of the magnetic field at a/2 and 2a from axis of the wire is: [08 Apr. 2024 - Shift 2]

(1) 1 : 4

(2) 1 : 1

(3) 3 : 4

(4) 4 : 1

Ans : (2)

Homework

- PYQ (Attached)


THANK
YOU
ATDB.uno