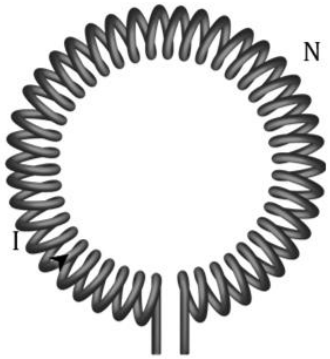
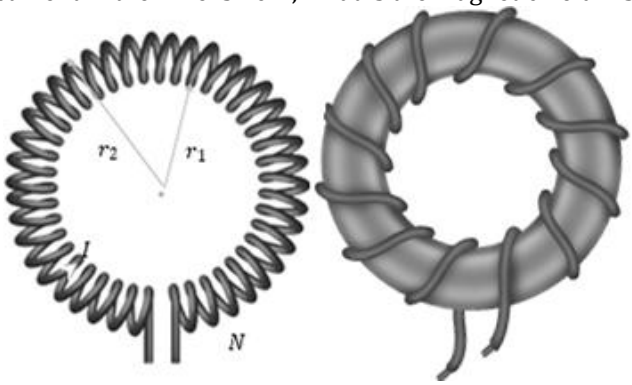
Q.1 An air cored toroid 10 **turns per** cm carries a current of 1 mA. The intensity of magnetic field inside it is



(A) $4\pi \times 10^{-6}$ T **(B)** $4\pi \times 10^{-7}$ T **(C)** $4\pi \times 10^{-8}$ T **(D)** $4\pi \times 10^{-9}$ T

Q.2 A toroid has a core of inner radius 20 cm and outer radius 22 cm around which 4200 turns of a wire are wound. If the current in the wire is 10 A, what is the magnetic field inside the core?

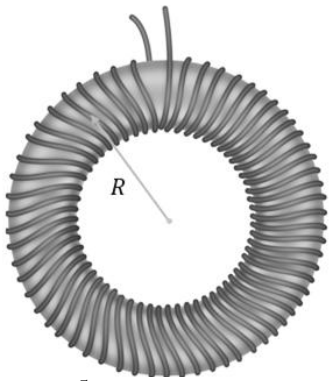


(A) 3×10^{-2} T **(B)** 1×10^{-2} T **(C)** 4×10^{-2} T **(D)** 2×10^{-2} T

Q.3 The magnetic field inside a toroid of radius R is B. If the current through it is doubled and the radius increased four times keeping the number of turns per unit length same, then the magnetic field produced by it will be

(A) B **(B)** 2B **(C)** 4B **(D)** $\frac{B}{2}$

Q.4 A wire of length 314 cm is used to make a toroid of cross- sectional radius 2 cm. Find the magnetic field at the inner core of the toroid having average radius of 50 cm and current flowing through it is 2 A.



(A) 2×10^{-5} T **(B)** 0.5×10^{-5} T **(C)** 1×10^{-4} T **(D)** 0.25×10^{-3} T

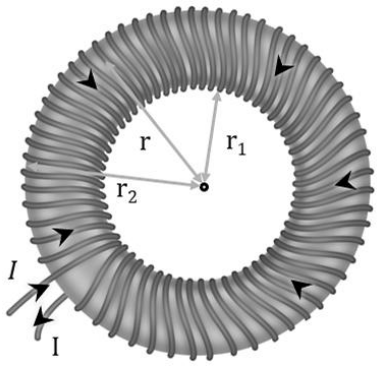
Q.5 Calculate the number of turns in a toroid when the charges of 8 C flows in 1 minute through it, produce a magnetic field of 2.5×10^{-4} T.(Radius of toroid is 20 cm.)

(A)1275 **(B)**1875 **(C)**1675 **(D)**2075

Q.6 A toroid having a square cross-section of side 5 cm and inner radius of 15 cm, has 500 turns and carries a current of 0.8 A. What is the magnetic field just inside the outer radius of the toroid?

(A) 2×10^{-4} T **(B)** 3×10^{-2} T **(C)** 4×10^{-4} T **(D)** 4×10^{-2} T

Q.7 A toroid has an inner radius of 5 cm and outer radius of 8 cm. A point *P* is located inside the toroid at a distance of 5.5 cm from the center of the toroid. The toroid carries a current Iand the magnetic field at point P is equal to B due to this current. If the toroid suddenly shrinks such that its inner radius becomes 3.5 cm and outer radius becomes 7 cm, keeping the current and number of turns the same. What will be the value of the magnetic field at point P in the later case?



(A)B/2 **(B)**B **(C)**B/3 **(D) 2B**

Q.8 A toroid made up of a circular core has inner circumference 30π cm and 2400 turns. The relative permeability of the material is 1000. What is the cross-sectional area of the core when a current of 0.75 A passes through the winding, a magnetic field of strength 2 T is produced at its mean radius?

(A) 225π cm^2 **(B)** 225 cm^2 **(C)** 3π cm^2 **(D)** 9π cm^2

Q.9 A copper wire having resistance of 0.01 Ω is used to wind a 400 turns toroid of inner radius of 2 cm and outer radius of 3 cm. Find the emf of a battery which when connected across the toroid will create a magnetic field of 1.0×10^{-2} T at a distance equal to the mean radius of the toroid, from the center of the toroid.

(A)31.25 Mv **(B)**30 mV **(C)**25 mV **(D)**21.25 mV

Q.10 A toroidal solenoid has an inner radius of 12 cm and an outer radius of 15 cm. It carries a current of 1.50 A. It must have turns (equally spaced), so that it will produce a magnetic field of 3.75 mT at radial distance 14 cm from its centre.

Q.	1	2	3	4	5	6	7	8	9	10
Sol.	(B)	(C)	(B)	(A)	(B)	(C)	(B)	(D)	(A)	

ANSWER KEY