



PHYSICS

BOOKS - SAI PHYSICS (TELUGU ENGLISH)

ELECTROMAGNETIC INDUCTION

Mcqs

1. The magnitude of the induced emf in a coil of inductance 30 mH in which the current

changes from 6A to 2A in sec is

A. 0.6V

B. 0.6V

C. 1.06V

D. 6V

Answer: A



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2. A small square loop of wire of side 'l' is placed inside a large square loop of side L ($L > l$). If the loops are coplanar and their centres coincide, the mutual induction of the system is directly proportional to

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

B. $\frac{l^2}{L}$

C. $\frac{1}{L^2}$

D. $\frac{l^2}{L^2}$

Answer: D



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3. A coil of wire of radius r has 600 turns and a self inductance of 108 mH. The self inductance of a coil with same radius and 500 turns is

A. 80mH

B. 75mH

C. 108mH

D. 90mH

Answer: B



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4. The electrical field for an electromagnetic wave in free space $E = i30(kz - 5 \times 10^8 t)$, where magnitude of E is in V/m. The magnitude of wave vector k is (velocity of em wave in free space $= 3 \times 10^8 \text{ m/s}$)

A. 0.46 radm^{-1}

B. 3 radm^{-1}

C. 1.66 radm^{-1}

D. $0.83 \text{radm}(-1)$

Answer: C



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5. Two short magnets have their magnetic moments 1.2 Am^2 and 1.0 Am^2 . They are placed on a horizontal table parallel to each other at a distance of 20 cm between their centres, such that their north poles pointing towards geographic south. They have common

magnetic equatorial line . Horizontal component of earth 's field is $3.6 \times 10^{-5} T$. Then , the resultant horizontal magnetic induction at mid point of the line joining their centres is ($\frac{\mu_0}{4\pi} = 10^{-7} N/m$)

A. $3.6 \times 10^{-5} T$

B. $1.84 \times 10^{-4} T$

C. $2.56 \times 10^{-4} T$

D. $5.8 \times 10^{-5} T$

Answer: C



6. A Primary coil and secondary coil are are placed close to each other . A current changes at the rate of 25 A in a millisecond ,is present in the primary coil .If the mutual inductances is $92 \times 10^{-6} HzH$, then the value of induced emf in the secondary coil is

A. 4.6V

B. 2.3V

C. 0.38mV

D. 0.23mV

Answer: B



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7. A straight conductor of length 4 m moves at a speed of 10m//s When the conductor makes an angle 30° with them direction of meganetic filed of induction of $0.1 \text{ Wb} - m^2$, then induced emf is

A. 8V

B. 4V

C. 1V

D. 2V

Answer: D



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8. Some physical quantities are given in the list I and related units are given in the List II
Match the correct pairs in the lists .





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9. Match the following and find the correct pairs .



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10. The intensity of the magnetic induction field at the centre of a single turn circular coil of radius 5 cm carrying current of 0.9 A.





11. The number of turns in primary and secondary coils of a transformer is 50 and 200 respectively .If the current in the primary coil is 4 A then the current in the secondary coil is

A. 1A

B. 2A

C. 4A

D. 5A

Answer: A



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12. A rectangular loop length l and breadth b is placed at distance of x from infinitely long wire carrying current I such that the direction of current is parallel to breadth. If the loop moves away from the current wire in a direction perpendicular to it with a velocity v , the magnitude of the emf in the loop is ($\mu_0 =$ Permeability of free space)

A. $\frac{\mu_0 i v}{2\pi x} \left(\frac{1+b}{b} \right)$

B. $\frac{\mu_0 i^2 v}{4\pi^2 x} \log\left(\frac{b}{1}\right)$

C. $\frac{\mu_0 i l b v}{2\pi x(1+x)}$

D. $\frac{\mu_0 i l b v}{2\pi} \log\left(\frac{x+1}{x}\right)$

Answer: C



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13. A small square loop of wire of side 'l' is placed inside a large square loop of side L (L > l). If the loops are coplanar and their centres

coincide, the mutual induction of the system is directly proportional to

A. $\frac{L}{l}$

B. $\frac{l}{L}$

C. $\frac{L^2}{l}$

D. $\frac{l^2}{L}$

Answer: D



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14. An inductance 1 H is connected in series with an AC source of 220V and 50Hz. The inductive reactance (in ohm) is

A. 2π

B. 50π

C. 100π

D. 1000π

Answer: C



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15. A coil has 1,000 turns 500cm^2 as its area. The plane of the coil is placed at right angles in a magnetic induction field of $2 \times 10^{-5}\text{Wbm}^{-2}$. The coil is rotated through 180° in 0.2 s. The average emf induced in the coil, in mV is

A. 5

B. 15

C. 10

D. 20

Answer: B



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16. A conducting rod of length L rotates with angular speed ω in a uniform magnetic field of induction B which is perpendicular to its motion. The induced emf developed between the two ends of the rod is

A. $\frac{BL^2\omega}{4}$

B.

C. $BL^2\omega$

D. $2BL^2\omega$

Answer: B



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17. If a change in current of 0.01 A in one coil produces a change in magnetic flux of 2×10^{-2} Wb in the other coil, then the mutual inductance of the two coils in henry is

A. zero

B. 0.5

C. 2

D. 3

Answer: C



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18. A varying current in a coil changes from 10A to zero in 0.5 s. If the the average emf induced in the coil 2V, the self inductance of the coil is

A. 5.0H

B. 0.1H

C. 11.0H

D. 12.0H

Answer: B



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19. A varying current in a coil changes from 10A to zero in 0.5 s. If the the average emf induced

in the coil 220V, the self inductance of the coil is

A. 5.0H

B. 10.0H

C. 11.0H

D. 12.0H

Answer: C



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